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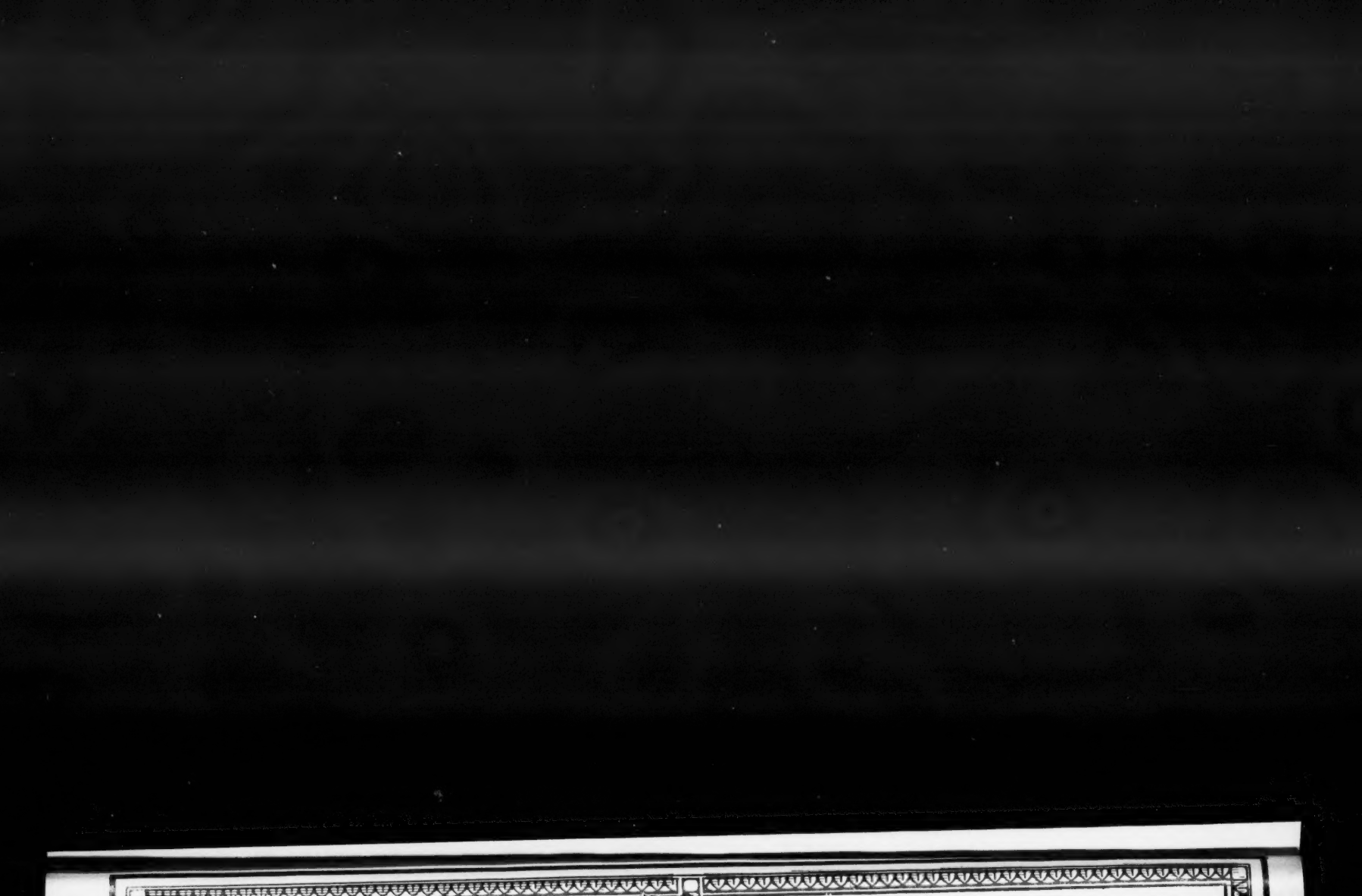

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VOL. XII FEBRUARY, 1917 No. 2

Practically Significant Facts About Abortion Disease*

By E. C. SCHROEDER, M. D. V., and W. E. COTTON, D. V. M., Washington, D. C., of the Bureau of Animal Industry Experiment Station, Bethesda, Md.

BEFORE presenting and discussing the several facts we believe our work has revealed or confirmed, we wish to say that we are not imbued with the idea that we have solved, or have nearly solved, or are rapidly approaching a solution of the multiple, intricate problems that shadow our knowledge of the unique evil known as infectious abortion disease of cattle. We incline to the view that this evil, evidently caused by an obligatory microparasite, can be subjected to control quite easily once the factors are clearly defined on which its transmission from victim to victim depend, and this is a reasonably hopeful view to take. But, when we think of the insidious, chronic character of the disease and realize that many of its victims become more or less enduring, in some instances perpetual, disseminators of its etiological parasite, we cannot fail to comprehend that the real victory may lie far in the future and beyond a mountain of hard work.

The first fact with which our paper proposes to deal may be formulated as follows: Cows attacked by abortion disease often remain carriers and disseminators of abortion bacilli long after they have ceased to abort, and cows which have been exposed to infection but have never aborted may be carriers and disseminators of abortion bacilli.

The evidence on which this fact rests is so conclusive that it is doubtful whether anything can overthrow it without first proving that we are wholly in error regarding the specific cause of infectious abortion disease of cattle. Since the statement was published, in the spring of 1912, by the Chief of the Federal Bureau of Animal Industry, that a bacterium, previously described by members of the Bureau's staff of investigators as of common occurrence in market milk, which was expelled from the udders of cows and caused lesions in guinea pigs macroscopically somewhat resembling tuberculosis, had been identified as the bacillus of infectious abortion disease of cattle, abundant evidence has accumulated to prove that cows affected with abortion disease often harbor this bacillus in their udders.

Practically All Aborting Cows Have Infected Udders

The proportion of infected udders among cows exposed to abortion disease has not been definitely determined. Our investigations imply that the udders of practically all cows which actually abort are at least temporarily infected. In one herd, numbering more than 150 cows, among which abortions had occurred with varying frequency for several years, a single test of the milk of each revealed that 14 per cent were expelling abortion bacilli from their udders. Had the milk of each cow been tested repeatedly the percentage, without doubt, would have been higher, as our work shows that milk from infected udders contains abortion bacilli in sufficient number for their detection intermittently rather than

*Presented at Twentieth Annual Meeting U. S Live Stock Sanitary Association.

continuously. The proportion, however, judged from the tests in this herd, is large enough to indicate that cows with udders from which abortion bacilli are being eliminated, classified as to their rank among apparently healthy, long persistent carriers and disseminators of disease germs, have a good chance to win an unenviable distinction as real champions.

The period of time during which the udder remains infected varies greatly. After hundreds of tests with milk from many cows we concluded, though the infected condition of the udder may terminate quickly, it tends, as a rule, to persist indefinitely. In one of our cases it persisted from its discovery until the cow died seven years later, and we have a number of cases in which it persisted from one to four years.

Abortion May Be Carried to Uninfected Herds by the Use of Infected Milk

The significance of this fact is that once a cow has been exposed to abortion disease it is wise to look upon her as a probable, persistent carrier and disseminator of abortion bacilli, and as an unsafe animal to introduce into an uninfected herd. And, further, that milk from unproved sources, used in its raw state as food for farm animals, is a possible agent through which abortion disease may be introduced into previously uncontaminated herds.

The second fact, or group of facts, with which we will deal, concerns the occurrence and persistence of abortion bacilli in the uterus. When a cow has aborted, the fetus, the afterbirth, the uterus and discharges from the vagina are infected with abortion bacilli, and it is important to know that the bacilli remain alive and virulent in dead animal tissues under conditions favorable for their preservation long enough to make negligence or carlessness regarding the proper disposal of the named products of abortions eminently dangerous.

Abortion Bacilli Do Not Maintain Themselves in the Unimpregnated Uterus

In the uterus, contrary to what the general character of the disease may lead us to suppose, and contrary to what is true of the udder, abortion bacilli do not seem able to maintain themselves; or, more precisely, do not seem able to maintain themselves at other times than during pregnancy.

We have the records of two cows, one of which harbored abortion bacilli in her uterus forty-six, and the other fifty-one days after aborting, but our tests, taken as a whole, lead us to believe that these are rare cases, and that the period during which the uterus remains infected commonly does not exceed two to three weeks. Probably it varies greatly, in a measure parallel with the damage incident to and accompanying the abortion.

In non-pregnant uteruses, excepting shortly after abortions or parturitions, our numerous tests utterly failed to detect abortion bacilli. At one time we entertained the hypothesis that the increased activity of the reproductive organs during the estrual period would offer abortion bacilli, absorbed from an infected udder and distributed inwardly through lymph and blood channels, a chance to multiply and establish themselves in the uterus and related organs; but this did not prove true, and not a shred of evidence to support it was obtained. We found, moreover, that suspensions of abortion bacilli injected into the non-pregnant uteruses of several cows could not be proved to have remained alive more than a week. The cows were later served by bulls, conceived and produced calves.

But, though abortion bacilli do not seem able to inhabit the non-pregnant uterus, there is a true correlation between their occurrence in the udder and the uterus, and the nature of this is defined in the following statement:

A Correlation Between the Occurrence of Abortion Bacilli in the Uterus and the Udder.

When a cow with an infected udder produces a seemingly normal calf in a seemingly normal manner, her uterus and the afterbirth are likely to be infected with abortion bacilli, and this is true irrespective of whether it is the first, second, third or fourth calf after an abortion or a calf produced without a previous abortion.

The tests on which this statement is based concern nearly an equal number of two kinds of cows; one kind harbored abortion bacilli and the other did not harbor abortion bacilli in their udders. Parturition among cows of the former kind, cows with infected udders, in about half of the cases tested, was associated with the occurrence of abortion bacilli in the uterus and the afterbirth. In no case were abortion bacilli discovered in the uterus or afterbirth at seemingly normal parturitions unless the udder was proved through tests with milk to be infected with abortion bacilli.

We recently examined our records with reference to cows of which we could say with certainty that they did not harbor abortion bacilli in their udders prior to abortions; we found only one doubtful case. But the total number of abortions

on which our records are complete is too small to give us reliable data for an important conclusion. We hope that the simple mention of this matter may stimulate others to make observations along the same line, as it may help to throw more light on the practical significance of the occurrence and persistence of abortion bacilli in the udder.

Most investigators know that the available literature countenances the belief that it is difficult to induce abortions through carefully guarded, experimental exposures of previously, certainly uninfected cows, unless the exposures are intimate contact with infected cattle, the intravenous injection of abortion bacilli, or the subcutaneous injection of inordinately large numbers of abortion bacilli. In speaking of the literature here we do not include those earlier publications, though they are still quoted in modern text books on animal diseases, which would lead us to believe that abortion disease can be induced experimentally, without much trouble, in many different species of animals, through almost any kind of artificial exposure, as it is questionable whether experimentally induced, infectious abortions, reported before we had the means to prove that the experiment animals used were truly free from infection at the time of their intentional exposure, can now be credited as having much value.

As we have already stated, injections of abortion bacilli into the non-pregnant uterus, as far as we have tested this form of exposure, is followed by their rapid disappearance, and such injections do not cause cows to react positively with abortion tests. We admit that our work regarding this matter, because of the small number of animals used, cannot be accepted as finally conclusive, but its reliability is enhanced by its agreement with the fact that abortion bacilli disappear from the uterus very rapidly after abortions, and, as far as we know, even more rapidly when the uteruses of cows with infected udders harbor abortion bacilli after seemingly normal parturition.

Udders Infected by Intravenous Injection.

When we inject non-pregnant cows subcutaneously with moderate quantities of suspensions of abortion bacilli, the only result we have observed is that they later react positively with abortion tests. The power to react endures varying periods of time, and seems to be passive as distinct from active. Whether the subcutaneous injection of pregnant cows with moderate quantities of abortion bacilli causes them to abort, we believe to have remained an open question, on which our work has thrown no satisfactory light.

When we inject suspensions of abortion bacilli into the veins of non-pregnant cows they disappear from the circulating blood in the course of about two hours, and when such cows are killed sometime afterwards careful post mortem search fails to reveal the bacilli in their bodies until we test their udders, and there they may have established themselves. One of our records concerning this phenomenon is particularly interesting; it is that of an adult, virgin animal, a heifer, approximately four years old; its udder was not functioning and never had functioned, but became infected through the intrajugular injection of abortion bacilli.

It may be well to say that cows invariably react positively with abortion tests when their udders are infected, and that, in the numerous tests we have made with milk from many different cows, abortion bacilli were never found in the milk unless both it and blood serum of the cow agglutinated suspensions of abortion bacilli. This does not mean that all cows, the milk and blood serum of which agglutinate suspensions of abortion bacilli, have infected udders, because that is not true. But, if further tests give results like those already obtained we will have evidence to support the following, now tentative or provisional, conclusion; that abortion reactions with either or both the milk and blood serum of cows with uninfected udders are passive in character, while reactions with milk and blood serum of cows with infected udders are active, and endure as long, and somewhat longer than the infected condition of the udders.

When we inject abortion bacilli into the udder through the teat, though we use a method which obviates mechanical injury, we establish the bacilli in the udder, and the cow becomes truly infected according to all available tests.

One record regarding the injection of a suspension of abortion bacilli into the udder of a cow through the teat, in a manner which almost certainly obviated or precluded mechanical injury, is equally interesting and instructive. The cow was well advanced in pregnancy at the time the injection was made, and both she and the bull by whom she had been served, according to their history and repeated abortion tests, were entirely free from abortion disease. On the 53rd day after the injection and the 279th day after service by the bull, the cow gave birth to a weak, undersized calf, which, however, rapidly gained

strength and has since become a seemingly normal, vigorous animal. The parturition was associated with a retained afterbirth, which, on removal, showed much abnormal material of a yellowish color, and this was proved to be infected with abortion bacilli. Furthermore, the cow's uterus remained infected with abortion bacilli a little longer than two weeks following the birth of the calf.

This case, taken in conjunction with other evidence our work supplies to prove that the presence of abortion bacilli in the udder is correlated with their occurrence in the uterus and afterbirth, even at seemingly normal parturitions, has the character of a true, experimental demonstration of the transition of abortion bacilli from the udder to the pregnant uterus.

Before drawing the practically important conclusion the facts so far presented suggest and support, we must take a look at another group of facts which point in the same direction.

If the results obtained with numerous tests are reliable, abortion bacilli do not have the power to maintain themselves in the bodies of cattle elsewhere than their udders and pregnant uteruses. We have killed a number of cows which reacted positively with all abortion tests and the udders of which harbored abortion bacilli. The blood, spleens, livers, kidneys, ovaries, fallopian tubes, uteruses, vaginas, udders, milk, synovial fluid from various joints, nerve tissue, lymph glands from all portions of the body, etc., were tested for abortion bacilli, with the following results: In all cases two or more quarters of the udder, the milk from the infected quarters and one or more supramammary lymph glands, and in one case some of the pelvic lymph glands, were found to be infected with abortion bacilli, and all the other organs and tissues invariably failed to show the presence of abortion bacilli.

Truly, if abortion bacilli live and multiply elsewhere in the bodies of cows than their udders and pregnant uteruses, no matter how small their number, our numerous tests should have given us at least an occasional positive result with other material than that derived from udders and associated lymph glands.

Reaction to Abortion Tests Only Passive in Calves.

We know that aborted fetuses harbor abortion bacilli in their stomachs, intestines, lymph glands, livers, spleens and blood and in subcutaneous extravasations of serum; our tests have verified their occurrence in all these regions. And we found that seemingly normal calves, produced in a seemingly normal manner, by cows with infected udders, may harbor abortion bacilli in their stomachs and gastrohepatic lymph glands. The calves used to obtain this knowledge were killed shortly after they were born, within a few hours, and were not permitted to come into contact with the bodies of their mothers, or other sources of infection, which possibly might have introduced germs into their bodies not present at the moment of completed parturition. In every case in which the body of a calf of this kind was found to contain abortion bacilli, the afterbirth and the uterus of the mother also proved infected.

It is not uncommon for the blood of newly born calves of infected mothers to react positively with abortion tests, but it is uncommon for the blood of young cattle, more than three or four months old, to react. Our tests indicate that the blood of a newly born calf often reacts as strongly, or nearly as strongly, as that of its mother, but that this power to react declines rapidly and disappears in the course of two to three months, even if the calf is suckled by a cow with an infected udder. In other words, the reaction of the calf is a passive phenomenon. It should be active if abortion bacilli, not rarely present in the body at birth, were endowed with the power to multiply and persist. We cannot say that the potency of the blood of calves to react declines and disappears because the calf's body cannot produce the elements on which reactions depend, because we found that the injection of abortion bacilli into the bodies of calves causes the production of these elements. The reactions in calves, both the natural and the induced, as in the case of adult cattle which have received subcutaneous injections of abortion bacilli, are not enduring or active as we may assume they would be with the continued presence of abortion bacilli in the body.

Now, if we consider the several facts which have been presented collectively, it seems that we have a sound basis for a practically important conclusion relative to one manner in which abortion disease spreads from victim to victim, and this may be stated as follows:

Washing the Milker's Hands May Be More Important Than Douching the Cow's Uterus With Strong Germicides

If the udder of infected cows is a common habitat of abortion bacilli, in which they multiply and persist long periods of time, and the milk from infected udders is

infected with abortion bacilli, and the transition of abortion bacilli from the udder to the gravid uterus has been proved to occur, and the bacilli do not persist elsewhere in the bodies of cattle than their udders and associated lymph glands and gravid uteruses, infectious abortion disease may tend to spread through the penetration of abortion bacilli into the udders of cows from the hands of milkers in every herd which includes a single cow with an infected udder.

Think of the manner in which the udders of dairy cows are manipulated by milkers twice daily, and how easily such manipulation may lead to the suction of small quantities of infected milk or other fluid from the hands of the milkers through the teat into the udder, and probably you will be inclined to believe as we do, that it may be more important for milkers to wash their hands with hot water and soap after each cow is milked and before the next cow is approached, than to practice wholesale douching of the uterus with germicidal solutions.

Regarding this conclusion we have one request to make; namely, that it shall not be used as a reason for the unwarranted assumption that we discountenance other dangers of infection than the one it defines. Though we have little doubt that abortion disease is spread through the medium of the infected hands of milkers, we positively do not believe that this is the only manner in which it spreads.

In the same sense we do not wish our comment on uterine douching to be misleading. Douching may be good practice, but we believe its prime object should be a flushing or washing out, and not an attempt, to our minds practically futile, to destroy germs in the uterus with germicidal solutions. If the uterus is given a proper chance to contract and heal after an abortion or the removal of a retained afterbirth, the abortion bacilli it contains need occasion little worry, as they will rapidly disappear, and it is questionable whether reparative processes are not retarded instead of advanced by douching with irritating, germicidal solutions which are strong enough to kill bacteria in a reasonable length of time, or the time during which they remain undiluted, or it is safe to permit them to remain in the uterus. Those who doubt this statement and have the facilities, should make a few bacteriological tests to determine the germicidal potency of the best and strongest germicides with which it is safe to wash extensive mucus surfaces. Our observations, though not numerous, tend to prove that it is easier to harm living tissues with germicides than to kill germs with germicides in living tissues or on wounded, living surfaces. From our point of view good practice seems to require that we should strive first to remove pernicious bacteria from the living environment in which they may occur and to kill them afterwards, rather than to attempt to kill them in the living environment through the use of germicides in a manner which cannot fail to paralyze and destroy delicate tissues and possibly convert such tissues into excellent culture media for germs.

Normal Parturition May Disseminate the Infection

Another practical conclusion may be stated as follows: As a large proportion of seemingly normal parturitions among cows with infected udders is associated with infected afterbirth and the expulsion of abortion bacilli from the uterus, through the vagina, for a period of from one to three weeks, it is desirable that no carelessness should be permitted regarding the disposal of afterbirth in herds in which abortion disease has appeared; and, the segregation of cows which are about to calve, or have just calved, is strongly recommended.

The Bull a Questionable Factor in the Spread of Abortion

Before ending our paper, we wish to say a few words about bulls and virgin female cattle. As we know, such animals at times react with abortion tests; but, apart from the fact that the reactions must be accepted as evidence to prove that infection with abortion bacilli occurs through other channels than the udder, we know virtually nothing about their significance.

By subcutaneous injections of abortion bacilli we have sensitized male and virgin female cattle for abortion tests; but by feeding abortion bacilli we have not succeeded in our attempts to do this, which is quite in harmony with the rapidly fading reactions of calves produced and suckled by cows with infected udders. And by intravenous injections of abortion bacilli into female cattle, either heifers or cows, we may more or less permanently infect their udders. Whether the fact eventually revealed will be that exposure to abortion bacilli at a critical time is required to cause infection, or that exposure must occur under various conditions which enable the bacilli to thrive elsewhere in the bodies of cattle than their udders and pregnant uteri, cannot be foretold.

As we have emphasized that our tests in-

dicate that abortion bacilli do not persist in the bodies of cattle elsewhere than their udders and gravid uteri, it is important that we should record one noteworthy, possibly though not certainly unique or very rare, exception to the common rule. This was a bull, whose history, briefly, is as follows: Reacted with abortion tests; was at once killed and a searching post mortem examination made. The only lesion found was an abscess involving the epididymis of one testicle. The abscess was proved by cultural and animal inoculation tests to be infected with abortion bacilli. No other portion of the bull's body proved infected. Tests with blood, liver, spleen, lymph glands, testicles, different portions of the penis, seminal fluid, synovial fluid, etc., alike failed to reveal abortion bacilli.

Our attempts to produce a similar case of infection artificially failed; and, in agreement with the difficulties many investigators have had to obtain incriminating evidence against bulls, we have thus far failed to infect bulls in a way that justifies the assumption that they are important factors in the dissemination of abortion disease. Out attempts include subcutaneous and intravenous injections of suspensions of abortion bacilli, feeding of abortion bacilli and exposure through copulation. One bull failed to become infected though he served a chronically bulling cow so frequently that his organ of copulation became abraided and inflamed. Prior to the copulations in this case suspensions of abortion bacilli were injected into the vagina and uterus of the cow.

Guard All Possible Avenues of Entrance for the Infection

Regarding the dissemination of abortion disease by bulls we may say, however, that it would be foolhardy in the dim light of our present knowledge to take liberties with reacting bulls, or bulls from infected herds, or promiscuously used bulls. For the time being, the best advice we can give to prevent the further spread of abortion disease is, if your herd has escaped the disease, don't infect it through the careless introduction of animals which have not been proved safe through properly and carefully made abortion tests, and don't permit your cattle to come into contact, directly or indirectly, with other, possibly infected cattle.

Summary of the Conclusions Reached Regarding Contagious Abortion*

By DR. V. A. MOORE, Ithaca, New York.
Director, The New York State Veterinary College at Cornell University.

IT seems to me that it calls for a wiser head than I think any of us possess to attempt at this time to summarize the experiments made by different men on different lines for the purpose of obtaining valuable information on the subject of contagious abortion. It seems to me that we should be admonished at this time to collect the facts and hold judgment in suspension until there is evidence enough to help or to assure us in following some definite line.

This whole discussion reminds me very much of the discussions we formerly heard concerning malaria. You know after the cause of that disease was ascertained, all of those learned discussions dropped into insignificance. I cannot help but believe that now we are in the process of searching for the truth, and when that truth is found, very much that we look to at present as possibly important will drop into insignificance, and this whole matter will be cleared up.

Of course, we do not know very much as yet concerning Nature's process, but I do believe that great progress has been made already in our investigation of this disease. When you think or reflect for a moment that it is only twenty years since we have had any conception of a specific cause of this disease, and prior to that time all sorts of wild schemes were suggested, and then compare that state of affairs with the one we have today with this large amount of accumulated data, I think we will all admit that we have evidence that is pointing to definite results.

While it appears to me that it is impossible to attempt a summary, yet I should like to call attention to two or three things. In the first place, what progress has been made? We sometimes feel in these struggles for facts, what the different results that are obtained by different people and different conclusions that are sometimes drawn from the same data, that we are getting into a hopeless confusion; but out of this the truth is coming. So I believe we are to be comforted in the fact that certain things are known. For example,

*Extemporaneous discussion before the U. S. Live Stock Sanitary Association, Chicago, Dec. 6, 1916.

there seems to be little doubt that this disease is due to a definite cause—to a definite organism. Now that is a great deal; but we have more than that. I think it is pretty generally conceded that what you may call perhaps the symptom complex of contagious abortion is pretty well defined; that is, the expulsion of the fetus, the retained afterbirth, the metritis and sterility, have been connected up in some way with this disease, so that we know the importance of it as directed in several lines. We have a conception of what this thing is and what it means economically. That is a great study in itself.

We have found that apparently abortion can be prevented when certain definite methods have been followed. Just what those methods are is very much like the use of antiseptics. One surgeon uses one solution and another a different solution. One man follows one method in treating his hands and one, another method. Both get good results because both are dealing with the fundamental principle. So here, while different methods may be followed, the accumulated data seems to point conclusively to the fact that if one of these methods, which is based on sanitary rules, is followed, better results are obtained than otherwise would be. So we have pretty definite results there.

We have found by a large amount of data that the treatment of the uterus such as washing it in the proper way has given excellent results, and many animals that did not otherwise breed have been made good breeders by cleaning out the uterus or the horns, and we have found in the analysis of this work that in these washings they get rid of pus and things of that kind which we can see would interfere. We can understand these things, and good results are obtained in many cases, although not in all. So that is progress.

We find certain animals that do not breed where the uterus seems to be all right, and here it has been pointed out by Dr. Williams and others that the proper treatment of the ovaries will enable a certain number of these cases to breed. Here we have another step in advance.

Then we have the question of white scours, which is perhaps a corollary to this disease. Certain methods have been followed by a number of breeders with excellent results. Perhaps we cannot say what particular thing will give the best results. All of these go back to general sanitary measures, guided by the different facts that we have.

The things I have mentioned, I think, are very generally acceded to, but there are other things that we talk about as knowledge and about which we are divided in various ways. There are many things about which people talk regarding which there is a great deal of controversy. We have in addition to the conceded practical things, things that have not been definitely ascertained. Among these is the question of the distribution of this organism. Is the germ of infectious abortion widely disseminated throughout the system and for some reason gains virulence, or is it a disease like tuberculosis, for example, due to a definite organism transmitted from one animal to another in all cases? These are questions regarding which there is a great deal of doubt and nothing definitely known, and we should withhold judgment in these cases until we can come to more definite conclusions.

Another problem along these lines is in regard to just how animals are infected. Is it through the digestive tract or through the genital organs? We must get at this point and keep right at it until the various ways are eliminated and we reach the correct conclusion. We may find that animals are infected in both ways. We may find the case to be similar to the two fellows who got into a fight over whether a flag was red or white. One said it was white and the other said it was red. After the fight they found that the flag was white on one side and red on the other. There are many ways and we cannot be positive about any one at present.

Another question is the feeding of calves. The organisms that produce this disease are created things like ourselves, and in the wisdom of the Infinite, there is a provision for them to get from one individual to another, and our problem is to find how it is done. If the udder becomes the reservoir of this organism, a thing by which it can be preserved and passed on, it is not unreasonable to suspect that the calves do become infected and that these organisms do become localized, as Dr. Schroeder pointed out, in the udder or in the uterus. How long they live we do not know. They are not always killed off in an organ at once. In some cases they may be. The difficulty is in drawing conclusions from individual experiences or from a single case. There are men who do not believe there is rabies because they never saw a case; so we may have experiences that are contrary to those of our neighbors, but a limited number of experiences is not sufficient to determine all of the facts.

Then there is the interpretation of the specific test. I do not know yet how we are going to interpret this. I have listened with a great deal of interest to the papers this morning to see if I could find any one who would know, but they do not seem to know. You test an animal and get an agglutination test or complement fixation test, but who is going to say the animal is infected or that it is an immune animal and one we should buy and put in the herd? We must have more knowledge before we can draw definite conclusions.

I think one of the most important things brought out in connection with this work in

abortion is the attempt of inexperienced men to apply these data without definite knowledge and without experience. I think we are getting into trouble right along on account of this inexperience. You cannot go at it in a miscellaneous, haphazard way. It seems that to those who are interested in the prevention of this disease, one of the most important things to see to, is that the men going out and advising stock owners in regard to this disease should be men of knowledge and skill in doing this work.

I think there is a tendency on the part of officials to look to the results of laboratory tests with a good deal more confidence than they are really entitled to. I feel it is leading to erroneous conclusions. Until we know what these tests mean, why should they be considered as final?

I cannot think of anything more to add, but I may repeat that I think progress is being made. We are, as the boys say, getting "hot." We are getting closer and closer to the truth, and some day some one is going to find just what we need to unlock the secret of the situation, and then this plague as other plagues, will be eliminated.

Some Diseases of the Udder in Cows*

By DR. R. C. MOORE, St. Joseph, Missouri.
President of the St. Joseph Veterinary College.

THE mamma or udder of the cow is situated beneath the prepubic region on either side of the linea alba and each mamma is divided into two secretory parts, but not by a septum.

Each secretory part has an excretory duct which reaches the surface through the mammilla or teat canal. The teats are from one to three inches long and vary in size and shape in different individuals. At the base, the mamma enlarges and is attached by loose cellular tissue to the ventral surface of the abdomen. The entire structure is clothed with a deflection of the skin of the abdomen. The lower end of the teat forms an infundibulum about three-eighths of an inch in length, with the small end upward. At the upper end of the infundibulum the skin forms a junction with the mucous membrane, lining the lactiferous sinus which enlarges as it reaches the apex of the udder and forms a reservoir for the milk which is secreted by the gland structure of the organ. The glandular mass is covered by an elastic envelop derived from the abdominal fascia and supported by suspensory bands from the abdominal tunic.

The enveloping membranes of the two mamma join in the median line and form the median septum, and send prolongations into gland separating it into lobes.

The glands belong to the racemose variety, united by quite an abundant cellular tissue. The various excretory ducts coalesce to form large ones which conduct the milk to the lactiferous sinus from which it reaches the surface through the teat canal.

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The nature and composition of milk make it an excellent media for bacterial development and the location of the udder in the cow predisposes it to many injuries, hence disease is common.

It is not the purpose of this paper to deal with the modes of infection, or the etiology of the various known diseases of this organ, but rather the diseases as they exist and their probable effect upon the future usefulness of the animal, and some of the modes of treatment, more particularly of the chronic forms.

Of the acute forms, three varieties will be noticed, according to the tissues involved, and the effect each would have upon the future usefulness of the organ.

For convenience, we will designate, first, the catarrhal form because it primarily involves the mucous membrane. Second, phlegmonous, because it primarily involves the areolar or cellular tissues and tends to abscess formation or gangrene. Third, parenchymatous, because it primarily attacks the gland tissue.

In the catarrhal form, the milk is early mixed with mucous that clogs the strainer, later becomes muco-purulent and may become sanguinous. As long as it remains a simple catarrhal inflammation and is limited to the lactiferous tubules and sinuses, the quantity of the milk is not seriously diminished; swelling and soreness is moderate if present at all.

It may continue for weeks, and terminate without deterioration of the gland, or may extend to the parenchyma and destroys the secreting powers of the gland.

The phlegmonous form is sudden in its attack and being confined to the arolar tissue seriously interferes with the circulation which

results in extensive edematous swelling of the part involved.

Being edematous, the swollen parts pit under pressure and the disturbance of the circulation tends to gangrene or the formation of many abscesses. The quantity of the milk is diminished but the quality is not visibly changed. The inflammation may extend to the parenchyma and stop all secretion of the part involved. If the inflammation remains in the areolar tissue, and gangrene does not supervene, the attack may last long as a fortnight and terminate in complete recovery without deterioration of the gland.

The parenchymatous form also attacks suddenly, unless it is an extension from one of the former varieties. It is usually confined to one quarter, or a part of a quarter, and causes intense pain and soreness, with little or no swelling, does not pit on pressure, but is marked by a stony hardness of the part involved.

As the glandular structures proper are involved, no milk is secreted, only a little bloody serum can be drawn from the teat.

The inflammation soon destroys the secreting power of the gland, and if not arrested in a few hours, renders that part of the organ useless thereafter.

Large abscesses may form and open into the lactiferous sinus or on the surface; in either case atrophy is a common sequel.

There are several forms of mammitis described that are due to a specific microorganism, but so far as the tissues involved are concerned, they can all be considered under the heads given, and time will not permit their discussion at present, as the real object of this paper is a discussion of that form of disease that mechanically obstructs the flow of milk, rather than diseases that interfere with function, so we will content ourselves with what has been said regarding the latter and proceed to consider the former.

For convenience we will divide the obstruction and mechanical lesions as follows:

They may be congenital or acquired.

Of the congenital we will note:

First, the absence of mamma.

Second, polymastia or more than the normal number of glands or teats.

Third, atresia mammilla.

The total absence of mamma is extremely rare, but has been noted.

In the polymastia, we may find an accessory teat with or without an excretory canal, or there may be a rudimentary lactiferous sinus and gland. When these accessory teats are present, they are usually in pairs, and situated posteriorly in the cow, and anteriorly in the goat.

Atresia mammilla consist of a closure of the meatus, resulting from the union of the mucous membrane of the lactiferous sinus with itself, rather than with the skin, and may occur at any point along the teat canal.

This condition is not noticed until the cow is fresh for the first time, when the distended quarter leads to an examination that will reveal the condition. If not interfered with, the aseptic condition of the milk will prevent danger of inflammation, and pressure of the over-distended quarter will soon result in distruction of the gland function; and the exudate will be absorbed and atrophy of the quarter will follow.

If surgical treatment is attempted it must be done under strict asepsis, and a canal established by free puncture and maintained by the daily use of the teat tube.

Acquired Lesions.

1. Atrophy.
2. Hypertrophy.
3. Contusions.
4. Wounds.
5. Abrasions, chaps and fissures.
6. Stenosis of the mammillary opening or teat duct.
7. Fibrous bands occluding the canal or lactiferous sinus.
8. New growths obstructing the canal.
9. Lactic calculi.

1 and 2. Atrophy and Hypertrophy are perhaps always due to previous inflammatory conditions and will call for no consideration, as their names imply the pathological conditions.

3. Contusions embrace all injuries made by impact with any blunt article without wounding the surface, as treads, horn thrusts, kicks, bruises from crossing fences, logs, stones, etc. If no infection occurs either from within or from without, but little inconvenience will follow, but should infection occur, either of the varieties of mammitis previously mentioned may supervene or abscess may develop, according to the causative organism, and treatment must be directed to meet the needs of the individual case.

4. Wounds may be of the udder or the teat, usually inflicted by bites of dogs, snags and barbed wire, the latter being by far the most common, or as a result of surgical incision for diseases within, and may involve only the skin and connective tissues, or may open the lactiferous sinus.

When confined to the skin and connective tissue, usually we find only such inflammation as may be expected when mixed wound infection is present and it should be treated accordingly.

When such wounds extend to the lactiferous sinus, the condition is far more grave.

The escape of milk through the wound retards granulation and usually results in a fistula. If the wound occurs when lactation is

scant the chances of closure are greatly enhanced, also wounds of the upper part of the lactiferous sinus heal more readily than do those lower down or on the teat, and the same is true of the so called fleshy udder, both of which is probably due to the greater amount of connective tissue in the upper part of the organ and in the fleshy udder.

If such wounds occur between lacteal periods, they usually heal without assistance or under ordinary wound treatment. If they occur during the lacteal period, then the first principle involved in their treatment is to place the udder, or that part of it involved in as near the same condition as it would be between lacteal periods, by preventing distention with milk. This is accomplished by keeping a milk siphon in the teat continuously, to allow the milk to flow out as fast as it is secreted.

The ordinary self retaining tube answers for this purpose, but should be provided with an inlet just above the retaining bulb, to prevent the milk from remaining outside the tube above the teat sphincter, which offers a good media for infection. The necessity for such drainage is increased if the wound is low down on the teat.

In using a milk tube, great care is necessary to prevent infection which is sure to be followed by mammitis. A milk tube must be well sterilized before inserting and the infundibulum of the teat cleaned and disinfected. The funnel shape of the end of the teat, with the big end downward offers a splendid place for dirt to accumulate, and the adhering milk makes it an excellent habitation for bacteria, and the shape offers good opportunity for these substances to be pushed into the teat when inserting the tube or other instruments.

All recent wounds of this type should be rendered as near sterile as possible, carefully and deeply saturated, sprinkled liberally with iodoform and coated with collodion and covered with cotton or gauze retained by adhesive tape. The tape may be carried completely around the udder or teat to hold them more securely. Should difficulty be experienced in keeping the tube in place, the protruding end may be passed through a hole in a piece of adhesive tape, and the ends of the same be secured to the dressings above. The tube should be removed twice daily, cleaned and disinfected by boiling at least ten minutes.

The dressing should be changed every two or three days, and continued with the stitches in place for two weeks. Ordinarily the tube should be retained at least one week longer. If this precaution is not taken, the newly united tissues are liable to give way under the strain produced by distention of the lactiferous sinus by milk.

If fistula has already formed, the fistulous tract must be surgically removed and the round orifice converted into an oblong wound by removing a triangular piece of tissue both above and below so as to allow the edges of the wound to come in a position evenly, otherwise the treatment is carried out as directed above. It is always best if circumstances will permit to postpone the treatment of a teat fistula until the cow is dry.

5. Abrasions, chaps and fissures.—Abrasions usually result from scraping the teat over sharp objects or the sharp edge of the calf's teeth in sucking.

Chaps result from exposure to unfavorable atmospherical conditions or to derangement of the secreting glands about the base of the teat or too much moisture in milking.

Fissures are the result of neglected abrasions and chaps. Chaps often lead to hemorrhage in milking, or the teat is seen to be bloody after the calf has sucked. Continual irritation and movement of the parts prevent healing, and connective tissue proliferation along the edges of the wound with possible molecular death of the more delicate tissues at the bottom soon converts the chap into a fissure. Infection produces inflammation and swelling with soreness and probably lymphatic enlargements. The teat becomes so painful that cows will neither permit the calf to suck or to be milked. The affected quarter becomes distended with milk. Infection may extend to the muscosa of the lactiferous sinus and catarrhal mammitis results or to the connective tissue and phlegmonous mammitis follows.

TREATMENT: Remove the cause. If the calf is sucking, remove it and milk cow or use a milking tube. In milking, keep the teat as dry as possible. If the teat is moistened during milking, dry it with a clean soft cloth and apply a mild antiseptic ointment. The following is useful:

℞—Boric Acid.....1 part.
Ivory White Petrolatum.....5 parts.
Mix to form an ointment.
Sig. Apply two or three times daily.

If fissures have assumed hard, indurated edges, these edges should be removed with a scalpel, but not to the extent of producing hemorrhage, and the bottom of the fissures lightly touched with phenol, then treated with the boric acid ointment.

Many other medicinal agents might be cited, but the boric acid and vaseline has proved so valuable with the writer, that I feel nothing else is needed; besides it is odorless and tasteless, hence does not spoil the milk.

6. Stenosis.—The term stenosis means a narrowing or constriction or diminution of a

(*Continued on page* 94)

Painless Surgery in Small Animals

By GEORGE W. LITTLE, D. V. M.
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THE dental and medical professions have made great strides in the past few years toward obtaining complete and harmless anesthesia. They have learned by sad experience that the administration of ether, chloroform and their mixtures is not always productive of the best results in operative surgery. The nausea attendant upon the use of ether and the uncertainty of the effects of chloroform in cases of heart disease are sources of grave concern to the surgeon. The efforts of the patient in his struggles to regain consciousness are frequently very detrimental.

The ill effects of such struggles are particularly marked in small animals, because they tend to bring on a renewal of hemorrhage and consequently the death of the animal.

Since the use of common anesthetics has been found unsatisfactory and dangerous, a safer and better method was sought and, fortunately, found. This is the nitrous-oxid-oxygen method. Rapid anesthesia may be induced without, in any way, incurring the risk of shock or inconvenience. The patient comes out of the anesthetic free from weakness, without violent struggling, and perfectly calm.

Nitrous oxid-oxygen has robbed the dentist's chair of its old time terrors. Until recently, however, the veterinarian has never attempted the application of this method of anesthesia when operating upon his small animal patients. The results of its use have exceedingly gratifying from the viewpoint of both the surgeon and the client. The knowledge that his animal friend will be absolutely free from pain while under the knife and free from shock after the operation means much to the client.

In adapting this anesthetic to animal surgery, the regular human nose and mouth piece is fitted with a collapsible cone of rubber sheeting. This cone may be strapped to the animal's head in such a manner that air is excluded. At the base of the inhaler there is an air vent that can be opened until the surgeon wishes to administer the gas. (See illustration on front cover.) When all is in readiness, the dog or cat is placed in the ventral position and the pure nitrous oxid is administered under pressure varying from 100 to 180 pounds. It requires from thirty seconds to two minutes to place the animal under complete anesthesia. The time depends largely upon the size of the animal and upon its physical condition.

In order to safeguard the heart action of the patient about five per cent oxygen is turned on the moment anesthesia is complete. This amount of oxygen will sustain the heart action for an indefinite length of time. If a greater quantity of oxygen is given, the muscles begin to contract and the reflexes return.

Complete consciousness is restored by turning off the nitrous oxid and administering pure oxygen. The patient is frequently revived in less than one minute. In two minutes the animal is able to walk to his kennel and lick his wound. I have allowed several of my cases to be taken home directly after the operation and in each instance the animal could walk out of the building.

The veterinarian is often somewhat handicapped by the slimness of his client's pockbook. This is especially true when the proper treatment of his patients involves a certain expense. The nitrous-oxid-oxygen method is practical for dogs and cats, but for horses, the cost would render it prohibitive, except in the case of unusually valuable animals. There is no doubt in my mind that we are coming to the general application of this method of anesthesia for horses. It will be adopted because of its absolute safety and because the patient under its influence totally loses the sense of feeling.

It would be necessary to employ the anesthesia for horses only during the time the surgeon is actually using the knife. The cost of the gas, therefore, would vary with the length of the operation. The expense would not amount to more than ten dollars in any case and in most cases it would be much less. The cost of the gas used for small animals varies from fifty cents to one dollar and fifty cents for an operation.

Our brothers of the medical and dental professions are constantly on the alert to discover, invent and apply all manner of treatment and apparatus that will reduce to a minimum the possibility of shock and discomfort to their patients, and at the same time bring about greater successes in their chosen professions. We are indebted to the science of dental surgery for many improved methods in anesthesia. For this we should feel deeply grateful to the dental surgeons of today. The nitrous-oxid-oxygen method was introduced by the dental profession. It is the *dernier cri* in modern anesthesia.

It is imperative that we, as veterinarians should grasp every opportunity to become more efficient in our work, especially in surgery. There is no longer any excuse for allowing a dog or cat to die as the result of sudden shock of induced sleep or for a horse to die of "chloroform" pneumonia subsequent to a major operation.

I have introduced this method of anesthesia for general surgical work in small animals. It has enabled me to operate on conditions, especially mammary tumors in old dogs, which without it I would have considered incurable on account of the danger of shock and hemorrhage subsequent to the operation.

The time is near at hand when our clients will insist on the use of the safest and most humane methods in the treatment of their animals. Why not adopt these methods before we are requested to do so?

"Pitfalls" in the Williams' Operation for Poll Evil

By J. V. LACROIX, Kansas City, Missouri.

Professor of Surgery in The Kansas City Veterinary College.

IT is not my purpose in this brief article to attempt an exhaustive discussion of the radical operation for the treatment of poll evil, but to consider specifically the immediate effect that this operation has upon the subject, especially in certain atypical cases.

It is generally acknowledged that the radical operation, consisting in the removal of diseased tissues by means of the long median line incision, constitutes the most practical method of treating poll evil. Consequently, the veterinarian who is not treating his cases in this manner, has to adopt this particular method sooner or later, or be placed at a disadvantage with his neighboring practitioners, to say nothing of the economic loss that he occasions his clients in employing a less desirable line of treatment. However, a word of caution to those who are not doing this operation but who contemplate its performance, regarding the execution of its technic, may not be amiss; and, incidentally, I shall record a few opinions that, if commented upon by others, may prove instructive to some.

The atypical cases of poll evil that are to be considered may be defined as those wherein there exists little if any swelling, no acute inflammation and practically no hyperplastic tissue. Such cases have either been given surgical drainage during their incipiency or spontaneous evacuation of pus has occurred. In these cases there usually exists a limited amount of necrotic tissue but sufficient involvement of the parts is in effect that intermittent swellings of the region of the poll occur and the condition remains a source of disturbance. During the quiescent periods, just after the parts have been swollen and evacuation of pus has taken place, spontaneously or otherwise, there is practically no evidence of the disease except for the slight discharge of pus—a stage wherein the practitioner may be uncertain whether the fistula will heal or whether it should be injected or curetted or left untouched. In these cases one should do the radical operation without hesitancy.

During the course of this more or less sanguinous operation, it is usually impractical to attempt the control of hemorrhage with forceps; the auto-cautery is not practical away from the hospital where assistants are not at hand to start it, and unless available means are present for heating an iron so that the operator may make use of the cautery just when it is needed, no time should be spent by the operator in preparing the iron for use. Where large vessels are divided they may be grasped with forceps if the tissues surrounding such vessels are not sclerotic. Otherwise, the operation is to be concluded as quickly as possible, and hemorrhage is then controlled by means of a pack of gauze.

In cases where little hypertrophic tissue

exists, where there is no dense tissue situated over the dorsal atlantoaxial ligament (atloaxoid), one need to be exceedingly careful to avoid causing pressure over this space, because it is in such cases that serious disturbance may be occasioned when the wound cavity is too firmly packed.

After having completed the operation and packed the wound cavity with gauze, or preferably with cotton wrapped with gauze, it is not enough to elevate the packing with a pair of forceps so that pressure does not bear upon the intervertebral ligament. The packing should be readjusted fifteen or twenty minutes after the operation has been completed, because by that time the packing shall have absorbed enough blood to cause harmful pressure upon the coverings of the spinal cord.

Not long ago, I had occasion to observe alarming symptoms which were caused in this manner. After having operated on a subject where little necrotic or hypertrophic tissue existed, I carefully packed the wound and within ten minutes the subject, which had practically recovered from the effects of chloroform, began to evince symptoms similar to those seen when horses are "pithed." In this case, however, breathing was accelerated and the subject struggled violently, but there was manifested the dilated nostrils, the rotary nystagmus, the blinking lids and the champing jaw that characterize division of the spinal cord. The general appearance of the subject was disquieting to say the least, enough to cause one to wonder if the spinal cord had been blunderingly injured. However, I explored the region over to the atlantoaxial space with a pair of curved forceps and found that the blood-soaked pack was contacting the intervertebral ligament, and the pack was carefully elevated. Soon the horse discontinued its struggles; the other symptoms subsided; and within fifteen minutes after the pack was readjusted, the animal was quiet.

On the following day, I had occasion to observe a similar condition that was caused in the same manner. This horse was a subject that was being used for students' work in surgical exercises and here, also, removal of pressure upon the intervertebral ligament was succeeded by a cessation of the symptoms evidenced, which were identical to those described in the first case.

In some typical cases of poll evil that have been operated upon, where a generous quantity of gauze or other material used for hemostatic purposes, has been left *in situ* for twenty-four hours, incoördination of movement is to be observed when such subjects are led from the stall. This, however, need not cause serious disturbance. The trouble disappears within a few days at most if the wound packing is removed as soon as hemorrhage is controlled.

In exceptional instances one may observe animals that suffer intermittently from pressure upon the dorsal atlantoaxial ligament occasioned by dense tissue that forms during the course of chronic cases of fistula of the poll. Trickett reports a case of this kind wherein the subject was not only incapacitated for service but would neigh and bawl in an unusual manner.

While credit is due Williams for conceiving this successful method of handling these cases, which were in many instances very troublesome to treat when dealt with otherwise, his technic has been improved upon by others. An improvement in the technic of this operation is in not molesting the crest of the occiput. This makes possible the completion of the operation in less time than where the nuchal (occipital) crest is grooved, and this also removes the possibility of the over-zealous novice's injuring the cerebrum. Moreover, drainage cannot be made perfect even by this removal of bone and, since adequate drainage is possible only by having the subject feed from the ground, removal of any portion of the occipital bone is unnecessary.

In a few instances where the ligamentum nuchae is not extensively affected and where little or no involvement of muscular tissues has taken place on one side, the ligament on the sound side may be left *in situ*. In these cases I have removed practically all necrotic tissue, but enough ligament is left on one side to afford firm attachment to the nuchal (occipital) crest. Where this is practiced, one must exercise care to remove all portions of the resected ligament from the occipital attachment so that no obstruction to drainage will result. Leaving one-half of the funicular part of the ligament attached to the occiput, when this is possible, is undoubtedly helpful in relieving some of the strain which otherwise falls to the musculature of the parts—the splenius complexus and rectus capitus muscles. The peculiar disposition of the lamellar portion of the ligamentum nuchae does not entirely compensate for the removal of all attachment of its funicular portion to the occipital crest.

In conclusion, I wish to recommend this operation in all cases of fistula of the poll, but as it has been pointed out, great care is necessary to prevent disturbances from pressure over the atlantoaxial space, or some bad results will eventually be noted by him who handles many of these cases.

And, finally, the veterinarian who is not doing this operation, would do well to make a regional dissection of the parts at his first opportunity, noting particularly by the sense of touch the relation of structures in the region of the usual site of poll evil. It is chiefly by the sense of touch that one is guided as to the exact location of the dorsal atlantoaxial ligament in all cases where considerable necrotic and hypertrophic tissue exists. By determining the amount of resistance to the finger that is directed against the intervertebral ligament, the surgeon can estimate how much tissue overlies the ligament; for doing injury to the ligament must be carefully avoided.

What of the Future?

By E. T. BAKER, D. V. M., Moscow, Idaho.

"NEXT spring th' boss is goin' to git a truck!" the coal man shoveling in his wares announced to me. This firm has four teams, and the veterinary work on them has more than paid my coal bill the past few years.

Our town of four thousand recently bought an auto fire truck; some are already in use by draying firms; others are talking of installing them.

"I went nearly busted last summer because I wouldn't believe the drivin' horse was on th' blink," said a once prosperous standard bred and hackney stallion owner. "You know them two stallions you examined last spring—well, I didn't pay expenses. You mentioned somethin' about adjustin' oneself to circumstances; well, I tried to adjust circumstances to suit me!"

"How was that?" was inquired.

"Well, the farmer that don't git an auto these days buys a Ford. I'm a going to rent a ranch and go into the cattle business with sheep on the side. Used to think they didn't mix well, but they make money. Might as well forget the driving and saddle horse, turn into a cow puncher or a sheep herder and make a little kale."

One comes into the average small western town and the two most desolate looking places are the extinct saloon and almost defunct livery stable. Our town used to support four livery stables; now one barely exists and dreams of the past.

Looking at things as they are, squarely in the face, not as we want to see them, if it had not been for the war, horses would not have been twenty dollars a piece out here. This is not due to the foreign demand as much as to the domestic. Two years' ago, for army buyers over two hundred head were assembled here. About thirty were taken at from $80 to $120. They were the choice ones and the sellers were envied by the less fortunate owners who took their nags back home. Later, these culls sold for $140 to $180 for southern or ranch use. General prosperity has done this, and the veterinary profession has profited thereby. But to the man who looks ahead how long will this continue?

Five years ago equine calls constituted eighty-five per cent of my practice; today it is barely forty per cent. The West has long associated a veterinarian as one who dealt almost exclusively with horses. Later, dairy practice came in vogue. Then, with the growth of the swine business, came calls from hog raisers. For a long time the average sheep man regarded a "vet" as a necessary evil, enforcing quarantines and raising much disturbance on scabies. Now, sheep practice is assuming the importance it always should have had. Poultry practice is just beginning, and about all that is left in the large cities is the dog and cat practice. Even wild animals are beginning to receive attention; witness the recent bulletin issued by the Canadian government on the care of foxes. In other words, the science of veterinary medicine and surgery is passing through a revolution that few of us realize until we look at conditions just as they are.

Among numerous other veterinary activities county agents have immunized over 200,000 hogs and God only knows how many calves the past year. Remember I do not condemn the county agent that knows his place and keeps in it. I know of one who is a prince. He devotes his time to crops and soils and animal husbandry and everything else pertaining to farm life, but when the rancher begins:

"Say Mister, I got a horse what ain't doin' right an———."

The agent returns quick as a flash:

"That is out of our line, and I don't know any more about it than if your child was sick. Better see Dr. Blank next time you go in town."

This is the ideal agent; he is broad minded. He does not know everything about everything. Turn the matter around; if

veterinarians instructed their clients how to build silos; make soil or milk tests; buy breeding stock and countless other tasks they well could perform without much additional training, how much work would be left for the county agent? Working together they can be of mutual benefit to each other and to the farmer.

Another dark cloud on the veterinary horizon is the well meaning but narrow minded agricultural college professor of veterinary science. The writer has been through this mill and he knows how difficult it is to dodge all seekers after free information. At a farmers' institute suppose the son-in-law of one of the regents of the college asks him a question and the professor refers the economical quizzer to his local veterinarian? The great trouble is that college and politics are synonymous in meaning. But here lies the secret: If the professor has been a practitioner himself he can diplomatically steer the eager searcher after free information to a local veterinarian and make friends of both. It is not so much the money part. It is the so-called prestige that college positions seem to confer, even their holders only making from one-half to one-fourth the monetary emoluments (whatever that means) that the man in private practice makes.

Federal activities only need to be lightly touched upon. The mere fact that federal veterinarians were required by the Department to discontinue practice altogether is testimony enough that this evil was prevalent. This would not have occurred had the Bureau appointed only men with from one to five years' experience as private practitioners. Then they would have learned to respect the latter rights. They would be today better paid because the rank and file of private veterinarians would work harder for them. Salaried men do not realize the power the private practitioners have politically. Nearly every one is a first class politician. They nearly always can muster enough influence to put through something, provided they work together. In the past, when the newly graduated man was appointed to be a federal inspector he yearned to help his country. His mental mammary glands exuded about six gallons of the milk of human kindness *per diem*. Later, even large doses of pilocarpin would not even bring a drop. He learned that free advice free service is usually accepted for what it is worth (and what it costs).

The veterinary answer columns in our farm journals used to reek with formulae and prescriptions, and whole neighborhoods relied upon these answers. With more and more graduate practitioners answering, less free stuff is handed out and more common sense advised. These farm papers are going to get some one to answer their queries and much harm could be avoided if only practitioners answered them.

With our equine practice slowly but surely fading away, what of the future? The changes of the times are as inexorable as death and taxes. We in the West note these changes occur more rapidly. In the past few years we have seen the passing away of the saloon; the actuality of woman suffrage; the legitimate theatre become almost extinct; thousands of settlers occupy land and raise big crops on farms that ten years ago were considered arid. New occupations; new industries; new inventions; new systems have all revolutionized living out here the past ten years. The man who has stood still has lost out. The man who retrogressed was sold out and left the country, cursing the few opportunities.

The future of veterinary medicine is reasonably hopeful if one is prepared to meet these changes. The army offers a few desirable positions, but only for the young men. Our meat, milk, wool and poultry interests are leaping forward by immense increases in number and value. Veterinary sanitation is receiving far more attention. The general practitioner, while his field is being narrowed, is assured of a livelihood, provided he can withstand the decrease in gross profits.

I feel sorry for the veterinarian who has neglected to lay up a "war fund" for the future. Who has made good money, but imagining he must spend it just as fast as he made it to be a good fellow, is always financially constipated. It took the writer some years to learn that a bank account or a good home paid for are two of the best assets a man can have. People have more confidence in him; he is more substantial; and he will feel more bound to respect that confidence.

What a pleasure it is to visit a town and in asking for the local veterinarian have a stranger answer:

"You'll find Doc's house down there on the corner; fine fellow and making good."

Quite different from:

"Oh! You'll find Doc down to th' Smokehouse playin' poker. He's that guy wit' a red nose and smells like ——"; well better not described. You feel quite proud of your profession, don't you? Hastily telling the man you are a drug salesman and just wanted to see him a minute you fade out of sight as rapidly as possible. And this applies to more than one graduate, unfortunately.

The next few years will witness a revolution in veterinary practice. Old lines will go out and new ones come in. It is going to work a hardship on the unprepared as the war has done to the people whose homes lay in the zone of battle. We have been patting ourselves on the back too much; we have been encouraging too many young men to enter veterinary science; we have pointed out the "easy money" but forget to mention collecting said cash. Commencement addresses have been as full of hope as a bloated cow is full of gas and they both are composed of the same element.

We have too many men occupying salaried positions who have never earned a dollar in private practice. They have no conception of the rights of the general practitioner. Their sins are more of ignorance than of wilful intention, but the harm is equal.

What of the future? Are you prepared to face it, or are preparing? This does not apply to future life, for a few years in practice soon saps what little spirituality a man may have; this is merely from an individual viewpoint.

Our journals are full of helpful articles along lines of disease and treatment, but very little is mentioned about the art of living and the art of grabbing off the wherewithal to live. Anybody with a little training or experience can four-flush a little while, but is it substantial?

Are you adjusting yourself to changing conditions, or, like the old actor, scorning moving picture opportunities, with his umbilicus pressing in on his spinal column, stands on the corner, cursing fate and talking of the "days gone by."

Better prepare while the preparing is good!

COMMENT: The changes in veterinary practice have been so rapid in the last decade that its course may be described as a series of transitions from one stage to another that have amounted altogether to nothing short of a resolution. These changes, this progress, for that is what it amounts to, has not come at the same time and in the same degree in all parts of the country. The first shock of the effect of the self-propelled vehicle was felt in this section some years ago. The outlook for veterinarians in this locality was then as it is now in the western range country, somewhat gloomy, and not a few were even more pessimistic as to what the future had in store for the veterinarian than is Doctor Baker just now. But the shock is past in the cities and all the light-horse practice is gone and half the draying and hauling is being done by motors. Veterinary practice has improved on the whole. Small animal practice has increased more rapidly than anything, but automobiles, and the latter by saving time in making calls, has helped the veterinarians as much as it has anyone else.

Soon after the automobile became popular in the city it became common in the small town and in the country and it has displaced many horses without doubt, but its greatest effect on the veterinarian was to enable him to do two or three times as much practice as before by enabling him to get his cases with less loss of time. Swine practice and a greatly increased amount of cattle practice soon equaled several times over the horse practice that had been lost.

Matters look their bluest right now to veterinarians in the range country. Almost before they know it there will be calls unnumbered for their services in places that are unthought of today. What can the great movement of pure bred bulls to the range country mean but that cattle raising of the better sort is at hand with its heavy requirement for veterinary skill? What can the unheard of prices of wool and mutton mean, but that sheep raising will be cultivated as never before and that sheep will be too valuable to let perish for the want of veterinary aid.

Unnumbered opportunities for veterinarians to serve cities and states await development only until there shall be available qualified material with which to fill such positions.

There can be no question about the call for the services of the man who is qualified. It is only the veterinarian who refuses to see the transition coming and to prepare for altered conditions that will suffer by the realignment. As Dr. Baker says, the man who stands still goes backward.—EDITOR.

A French veterinarion attached to the army uses the following form for obtaining surgical anesthesia in horses. He makes the claim that the anesthesia is just as profound as chloroform narcosis and that it is safer.

1. Feed is withheld for eighteen hours previous to the operation, but water is allowed.
2. Two hours before the operation 20 grams of sulphonal suspended in 500 grams of water is administered.
3. Half an hour hereafter an ordinary dose of chloral per rectum.
4. A quarter-hour before the operation 50 cg. morphin sulphate subcutaneously.

Piscullii, of New York, makes the statement in the New York Medical Journal that he has proven the clinical thermometer to be a disease carrier. He recommends the thorough disinfection of the thermometer every time it is used.

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The Trend of Veterinary Practice

ELSEWHERE in this number is to be seen a view of Dr. S. B. Manning's ambulance, his brief description of the vehicle and its cost. This will interest many veterinarians, for, in our opinion, Dr. Manning has shown himself enterprising enough to make use of a substitute for the horse to the end that with his clients he profits thereby. Not only does this venture denote an enterprising and progressive spirit, but it furnishes positive proof of its practicability.

It follows that the practitioner who owns such an ambulance must own, or have the use of, some sort of veterinary hospital. And, if the practicing veterinarian is to keep pace with the trend of the livestock interests, he will make provision for the care of animals where cases are met with that require better attention than can be given them by laymen, providing, of course, that the value of such patients justifies the expense.

The veterinary practitioner of tomorrow will not content himself in doing his work, with no facilities other than those that are to be had by merely maintaining an office somewhere, with room for only a small stock of drugs and his desk. In fact, the progressive veterinarian of today contrives to provide hospital facilities for his patients, as soon as he has practiced in a locality a sufficient length of time to determine that he is to become permanently established there. Realizing the necessity of being equipped to render the best services to their clients, many veterinarians co-operate in practice, either as partners or in sharing a hospital with one another.

Experience has taught that in any agricultural community a veterinary hospital, when properly conducted, affords the means of increasing the volume of one's practice from twenty-five to one hundred per cent during the first year of its management. Whenever a veterinarian has confidence in his ability to serve his clientele in a thoroughly competent manner and is willing to prove this by equipping a hospital to accomplish his purpose, he will find his clients ready and willing to give him and his hospital a trial. The only exceptions to this, where a hospital is properly managed, are in some sparsely settled localities and in districts where the inhabitants are not awake to the fact that they cannot afford to do without the services of a veterinarian.

In these times of high priced animal food products, it behooves the practitioner of veterinary medicine to become of greater service to his clients in the care of cattle, sheep and swine. Without ambulance wagons, very few cattle are treated in country hospitals, but where facilities for the quick transportation of patients are at hand, a new era in veterinary practice is dawning for the country practitioner. It will mean the transportation of all difficult cases that will admit of transportation to the hospital for treatment. This will include many obstetrical cases in cows. Successful surgical treatment of many mammary and teat affections will result and surgery, in all its phases pertinent to cattle practice, will show marked progress when these changes come to pass. All of this will place a greater responsibility on the general practitioner; a wider range of activity will be demanded of him; consultations will be of more frequent occurrence; better co-operation between practitioners will follow; and the fruition will be better qualified veterinarians who will prosper in the performance of useful service that will be more agreeable in the rendering.

BULLETINS EVERY VETERINARIAN SHOULD HAVE.

Meeting of Committee to Recommend Best Methods of Vaccination, Control and Eradication of Hog Cholera, Circular No. 56, Purdue University Agricultural Experiment Station, Lafayette, Ind.

—

Feeding Dairy Calves in California, by F. W. Woll and E. C. Voorhies, Bulletin No. 271, University of California, Berkeley, Cal.

—

Computation of Dairy Rations, Bulletin No. 143, by Fred S. Putney and Henry Prentiss Armsby, Pennsylvania State College, State College, Centre County, Pa.

—

Castration of Young Pigs, by Frank G. Ashbrook, Farmers' Bulletin 780, United States Department of Agriculture, Washington, D. C.

—

Canaries, Their Care and Management, by Alexander Wetmore, Assistant Biologist, Biological Survey, Farmers' Bulletin 770, U. S. Department of Agriculture, Washington, D. C.

—

Medicago Falcata, a Yellow-Flowered Alfalfa, by R. A. Oakley and Samuel Garver, Office of Forage Crop Investigations, Bulletin No. 428, U. S. Department of Agriculture, Washington, D. C.

—

Cost of Raising Leghorn Pullets, Bulletin No. 196, Purdue University, Lafayette, Ind.

Fattening Western Lambs, Bulletins Nos. 184 and 192, Purdue University, Lafayette, Ind.

—

Winter Steer Feeding, Bulletins No. 183 and 191, Purdue University, Lafayette, Ind.

—

Blackleg, Bulletin No. 3, State Veterinarian, Cheyenne, Wyo.

BOOK REVIEW.

A new edition (the fifth) of a Text-book of General Bacteriology, by Edwin O. Jordan, Ph. D., Professor of Bacteriology in the University of Chicago and in Rush Medical College, has just been published by the W. B. Saunders Company, of Philadelphia.

A number of insertions and additions have been made in this edition, including a new chapter on typhus fever. The sections on disinfection and on the testing of disinfectants have been rewritten, with a full discussion of the newer modes of procedure. The highly important recent work that has been done on the varieties and distribution of pneumococci has also received attention. There are new sections dealing with the Schick reaction, mouth entamebae, Hodgkin's disease, and some other topics on which information has become available since the preceding edition. Twenty pages are added and there are 177 illustrations.

The professions, medical and veterinary, are so well acquainted with this work that further description of this latest edition is unnecessary. The price of the work in cloth binding is $3.25.

Car, Ambulance and Hospital of Dr. X. G. May, Ft. Smith, Ark.

Department of Surgery

By L. A. MERILLAT, Chicago,
Professor of Surgery in the McKillip Veterinary College

Filing the Molars

FROM the earliest days of veterinary history reference is made to these operations. It seems that the sharp or the long teeth of horses were thought harmful to the equine welfare by even the ancient horsemen and during every epoch of veterinary progress this attempt to ameliorate the discomfort of horses arising from sharpness of the molars has been practiced to some extent. We are therefore dealing with an ancient operation when we attempt to describe filing of the teeth. The molar teeth of solipeds are constituted to grind harsh fibrous forage; they are rough like mill-stones and their edges are pronged, better to hold the forage between them. The prongs are sometimes long and pointed. In making an inspection of the mouth or an excursion into it with the hands it requires no imagination to arrive at the conclusion that some harm might accrue from them, and indeed since the buccal surface was so often found wounded or scarred from previous wounds it is no wonder that corrective dentistry was advised to avert these consequences.

The filing of teeth was, however, never practiced to any great extent until the harness race horse became such an important factor in American sportsmanship way back during the three decades following the Civil War. During these years the trotter, pacer, roadster and pole team were the precious possessions of everyone who could afford them, just as the automobile is today, and the spirit of contest that prevailed among the possessors of these animate propellers is a bit of interesting side-history that still stirs the blood of the old guard. Reflecting over my own youthful days and interviewing those still older it now seems plain that filing teeth began in earnest through the attempts of one owner to make his horse just a little better than that of his competitor. Where contests were close and keen, and fortunes were made or lost on the difference of an eighth of a second nothing was spared to remove every harmful element that might mitigate against speed in the slightest degree. It is therefore no wonder that the dentists of those days, who smoothed up the sharp molar teeth that punished horses that rode hard on the bit, was received with open arms and was given a status among horsemen that has never been equaled by any endeavor of veterinary practitioners to this very day. The services of the horse dentist were not only eagerly sought but they were pronounced absolutely essential to the welfare of a horse, and this without reservation. Tooth filing having thus been established as an essential element to the welfare of this class of horses was, quite naturally, adopted as a universal need of all horsekind. And it is here that veterinarians became the victims of their ambitions to please those who had been unwittingly led to believe that the sharp points were harmful even on the molars of a common work horse. During the past decade the fad has died out considerably, and the decline came with the disappearance of that class of horses wherein dentistry is a universal necessity. The decline has come through lack of actual demand for dentistry from horse owners. A few years ago when the expressman next saw his neighbor's roadster "getting its teeth fixed" naturally concluded that his jaded steed needed the treatment even worse than the other, and of course with words of assurance from

the dentist as to the virtue of his trade the work was invariably done, whether it was actually needed or not.

Owners of roadsters who not infrequently were also owners or managers of large stables of work horses, finding dentistry so helpful to the former would insist upon having every horse under their charge attended to. Thus filing the teeth was practiced where it was not really badly needed. The more serious dental disorders that were, however, disclosed in these careful examinations of the mouths, rewarded the owners for their enterprise, and did much to maintain the popularity of dentistry to the present day.

In regards to the actual indications for filing the molars of horses it is an incontrovertible fact that the better educated veterinarian of today has been too indifferent toward the operation to studiously analyze it. To simply brand tooth rasping as a more or less fakish operation has been a pastime that might now be profitably discontinued for a more serious inquiry into its merits, for it is needed and needed very badly in all closely and harshly bitted horses. In this class the polo pony belongs to the first rank. Here is a horse's mouth that is put to the severest test. In the sudden stops and sharp turn the player snaps the reins with such quick and forcible traction that the pony having pointed molars always comes out of the game with a badly bleeding mouth. Examined as to the cause, the cheeks are found to have been torn upon the jagged teeth, or if the first mandibular premolar has not been rounded so as to let the bit slide backward over it the diastema is also found badly bruised or torn open. In this class of horses the filing required as a preventive measure is that of "smoothing up" the pointed projections on the maxillary premolars and to "bevel off" the first mandibular premolar so that the bit will slip over it. With this protection bit injuries in polo ponies are almost entirely prevented.

In addition wolf teeth must be extracted and the bit fitted rather closely into the commissure of the lips.

The next class of horses in which filing is very much needed is the spirited, high-stepping hackney. Here are horses so closely rigged with two bits — the curb and bridoon — to assure that safe and prompt response to the reins by which their qualities are judged, that the least torture from sharp molars will oftimes upset all calculations as to their behavior. What might have been a smooth, even going show horse often becomes a senseless demon in the show ring from no other cause; and the same applied also to street and park driving. These horses like the polo pony, must have smooth premolars, and, on account of the pressure of a heavy closely fitted bridle on the region of the masseter, the maxillary molars also should be blunted. A careful examination of the mouth of a horse between the ages of five and eight years will reveal the fact that the second maxillary molars (the fifth) are prominently pronged at the ends of their longitudinal ridges. These prongs often in this class of horses wear a rounded wound into the mucous membrane that annoys both in eating and in driving, hence the necessity of running the float over the maxillary molars to blunt them.

The third class of horses in which filing is essential to their general welfare is the trotter and pacer. These horses pull heavily against the bit and in the turns, especially of a half-mile tract, draw considerably more upon one side than upon the other. When tortured with the pain of a wounded mouth the lightest handed driver may be unable to prevent breaks or otherwise to get the best possible speed out of his charge. These horses need filing like the others, particularly along the maxillary premolars — the first maxillary premolar especially should be made very smooth and round and to make a smooth trough for the tongue the mandibular molars may also be blunted, but these are not so important as the maxillary ones.

Saddle horses and hunters, but particularly the former, are "spoken" to largely through the medium of the reins and bit. The slightest abrasion of the mouth will set at naught any attempt to develop the flexile neck and the prompt, satisfactory response to the merest touch of the reins which distinguish the qualities of a saddle horse. The bad behavior of horses of fine instincts is too often met with harsh handling where gentleness alone would have brought out their fine qualities. Horses are like collie dogs; their instincts are too fine for the average human mind to comprehend. They are made a nuisance instead of a source of great satisfaction solely through our inability to conceive the fineness of their instincts. Dentistry here has untold merit, for a saddle horse with a sore mouth, in the hands of a connoisseur, is promptly condemned, as unresponsive to the touches by which its qualifying attributes are judged. In this class of horses, more than in the others, the maxillary premolars must be very smooth. The corners of the first premolars of each jaw must be well rounded, the tongue must lay in a smooth trough, and the wolf teeth

(*Continued on page* 96)

Therapeutic Digest

By MART R. STEFFEN, Milwaukee, Wisconsin

In a paper on "Strophanthus and Strophanthin," Corwall says in the *Medical Times*: "This strophanthin of the official pharmacopeia is a mixture of glucosides derived from the ripe seeds of Strophanthus Kombe," and its average dose is stated to be 1/200 grain. There are also in extensive use a number of commercial preparations of the drug, which vary in their dosage. This fact should be borne in mind in prescribing; and in any case which is not of an emergency character, requiring urgently the maximum dose, it is the part of caution to feel one's way with small beginning doses, if the preparation is not of a familiar make.

The administration of strophanthin by the intravenous method, in large doses and at comparatively infrequent intervals, has been especially recommended.

The effect of the drug when given under the skin is, in most cases, very nearly as powerful, if produced a little less speedily, than the effect when injected into a vein.

The size of the dose and the frequency of administration would seem to be determined largely by the fact that the drug is rapidly excreted; small doses frequently repeated should be the general rule. But in conditions of extreme cardiac failure it may be proper to give one very large dose, preferably intravenously.

Strophanthin is the heart stimulant of choice in severe cardiac insufficiency due to mitral stenosis or chronic myocardial degeneration."

Rhodes, of Kansas City, makes the statement in discussing the treatment of iritis that it is not proper to use an ointment of yellow mercuric oxid locally in the eye, when iodid of potassium is being given internally. He claims that the lachrymal fluid is impregnated with potassium iodid, which, when it comes in contact with the yellow oxid of mercury, precipitates mercuric iodid.

The latter acts as an irritant, and has a tendency to aggravate the condition treated.

Stephens, of Swansea, England, has succeeded in obtaining space in the New York Medical Journal for an article on the therapeutic value of distilled water, and the Medical Times thinks the contribution of sufficient worth to give it notice editorially.

The gentleman makes distilled water do some wonderful things, among which is the case of a man who was unable to work for several months, because of the effects of syphilis and gonorrheal rheumatism. Three injections of 10 mil. distilled water made it possible for the man to resume his occupation.

Chronic ear discharges, constipation and lead poisoning have also been treated satisfactorily by the same means.

To us it appears that matter for publication in the average medical journal is not censored rigidly enough. Material such as this could not get by the editor of a veterinary medical journal.

Interesting Topics. A perusal of the following table demonstrates the comparative youth of many of the most common scientific developments.

1877. Corrosive sublimate antisepsis was introduced.
1878. Causes of traumatic infections discovered.
1880. Sodin introduced in surgery.
1882. Bacillus of glanders isolated.
1882. Bacillus of tuberculosis isolated.
1883. Ichthyol introduced.
1884. Use of cocain in eye introduced.
1886. Steam sterilization introduced.
1886. Salol introduced.
1886. Acetanilid introduced.
1889. Antitoxins discovered.
1890. Tuberculin introduced.
1893. Roentgen X-Rays discovered.

1898. Bovine and human tubercle bacilli differentiated.

1901. Adrenalin introduced.

1913. Abderhalden test for pregnancy discovered.—Medical Times.

SOME DISEASES OF THE UDDER IN COWS

(*Continued from page* 82)

natural opening of an organ, and may be congenital or acquired.

Atresia differs from stenosis, in that the former means the failure of nature during uterine life to provide certain normal or natural openings of the body.

Stenosis has reference to the diminution in size from the natural as applied to congenital development or to a pathological diminution in size or closure of previously normal body openings.

In congenital stenosis of the teat, either the canal or meatus or both are unnaturally small and results in a *hard milker*. The teat is not closed, the lactiferous sinus fills, but only a small stream can be forced out by strong pressure.

TREATMENT consists in dilating the meatus. The cow should be securely tied, or better, cast and tied, and the teat dilator slowly inserted under antiseptic precautions and the teat thoroughly massaged so as to dilate the canal and stretch the tissues without rupture of their fibers, which would surely be done by sudden and violent dilatation.

This simple operation has proven most satisfactory to the writer. If there is anything that worries the milkman, it is the hard milking cow and this worry is renewed twice daily for several months in the year and if by one or two simple operations you can convert such a cow into an easy milker, your patron will surely be pleased.

Acquired stenosis is confined to the end of the teat, usually the result of injuries or ulcerative disease and is due to contraction of cicatricial tissue.

When involving the teat meatus or lower part of the teat canal, it is usually due to:

First, hypertrophy of the tissue from chronic inflammation.

Second, the contraction of a cicatrix.

As long as there is an opening, dilatation is indicated as recommended above. If the cicatrix is too dense for this, a long tapering sound should be passed once or twice which may be as much as $\frac{1}{16}$ or $\frac{3}{16}$ of an inch in diameter. It should be introduced under anesthesia and slowly forced into the canal.

Where the teat is completely closed it has been recommended to amputate the teat at the upper end of the stenosed part and allow the milk to flow out at will. It is said that in a few months a new sphincter will form to retain the milk.

7. Fibrous bands formed across the lactiferous sinus.—The etiology of the formation of these bands of connective tissue is not well understood. They form during the dry state and are only discovered after the cow has again come into milking. Then the quarter will be well distended with milk, but the teat below the obstruction will be limp and possess only a small quantity of limpid fluid.

On passing a sound, the obstructing membrane will be discovered, which may be punctured with the probe and the milk will run down into the teat and can be milked out, but the small opening will soon close.

Such bands may be placed vertically and cut off one side of sinus or may stretch across the teat or anywhere in the sinus.

TREATMENT: Puncture with the teat slitter and withdraw the slitter with the blade extended so as to cut as large a hole in the membrane as possible. If this fails, make an incision into the sinus under strict antisepsis and remove the obstructing membrane with scissors and treat the wound as prescribed for wounds involving the sinus.

8. New growths obstructing the canal.—These growths may be pendunculated, warty or of a fibrous nature, with wide base. The etiology is about as well understood as that of other tumors, which to say the least is not very definite. Like the fibrous bands, they usually develop during the dry stage and are discovered when milking is again necessary. They may completely obstruct the teat or only partially so. They can be felt through the teat wall.

TREATMENT: Various instruments have been constructed for their removal, but are not very successful. It is usually best to make a longitudinal incision over the tumor and remove it and treat the wound as directed for wounds involving the sinus.

9. Lactic Calculi.—Calculi of various size and number sometimes form in the lactiferous sinus and pass down into the smaller part of the execretory canal and obstruct it. They can usually be differentiated from tumors from the fact that they can be moved up and down the canal.

TREATMENT: By freely dilating the canal, they may be expelled by forcibly working them down the teat with the thumb and finger. If this fails, they must be removed by incision of the teat as directed for tumors.

I am more than pleased with "Lameness of the Horse." With me it fills a long-felt want.

Lealandia, Sash. CHAS. HUDSON.

WORLDS WORK in Veterinary Science

A digest of all the Current Literature of Comparative Medicine

Dr. Adolph Eichhorn
Washington, D. C.

Epileptic Convulsions in Dogs as a Result of Infestation With Ascarides

Dr. Sustmann (Munch. Tierarzt. Wochensch. Vol. 66, No. 30)

The author describes two cases of epileptic-like attacks in dogs which he was called upon to treat. In both instances it could be traced to an infestation with ascarides.

One animal, about 10 weeks old, well nourished, nose somewhat dry, eyes swollen and moist, eyeballs somewhat protruded, locomotion slightly impaired. During the examination the animal showed great anxiety.

The diet of the dog consisted of milk, boiled rice, and dog biscuits. The color of the urine was normal, reaction acid, its specific gravity 1,032, the odor was that of bouillon. Chemically a slight ámount of sugar was demonstrable. The microscopical examination of the feces revealed a large number of eggs, and several larvae of ascarides (ascaris mystax).

As a result of these findings the animal was given 0.1 of santonin with 30 gms. of castor oil, divided into three parts, administered in three doses, every four hours. About a dozen parasites were eliminated as a result of this treatment.

The epileptic form of attacks ceased, and have not recurred after the treatment. A subsequent microscopical examination of the feces failed to demonstrate the presence of ovas of the parasites.

The second case was a shepherd dog two years old, in fair condition, hair shedding, nose dry, conjunctiva reddened, and showed considerable depression. Feeding consisted of rice and remnants from the table.

The color of the urine and odor the same as in the first case, with specific gravity 1,028, sugar present in traces. Microscopical examination of the feces showed numerous ova of the ascaris mystax.

This animal was given 0.2 gm. of santonin in 45 gms. of castor oil, with the same result. General improvement of the animal followed.

Both of these animals, according to the statement of the owner, had repeated attacks of convulsions, during which they howled, showed sudden depression, rolling of the eyes, spasmodic contractions of the different parts of the body, opisthotonus, salivation, and a desire to bite. These symptoms entirely disappeared in fifteen minutes, and left the animals somewhat weak, with a swelling of the eye lids, and lachrymation, which lasted for several hours. The appetite and the general condition of the dogs was normal between the attacks.

The Cause of the Coagulation of Milk During Storms

Trillat (Compt. rend. 1915)

It is a well known fact that milk readily coagulates during a rain storm; the author attributes this to a lowness of the air pressure, which liberates the gases contained in the soil, and thereby creates conditions favorable for the propagation of the lactic acid bacteria contained in the air. These under such weather conditions may readily penetrate the milk, since in stormy weather there exists simultaneously a warmer temperature and increased humidity of the air.

The more rapid spoiling of other food (meat, game) likewise the frequently observed aggravation of wounds, or the rapid spread of infectious diseases under such conditions, are also attributed by the author to the same cause.

The Control of the Fly Pest

Kirschner (Munch. Med. Wochen. No. 25)

The author advises for the destruction of

flies the use of arsenic, especially in hospitals. For this purpose the deep part of a soup plate is filled with beer, to which a solution of arsenic is added. This is prepared by dissolving arsenical acid (as much as can be lifted on the point of a knife) in several tablespoonsful of boiling water. The flies partake ravenously of the poisoned beer, as a result of which they die.

After a while the poisoned beer becomes moldy. The loss from evaporation in the meanwhile can be restored by the addition of water. The poisonous liquid, however, should be renewed after it becomes moldy.

If instead of beer a sugar solution is prepared in a similar manner this would retain its keeping qualities indefinitely. The evaporated water should be replaced from time to time. The sugar solution, however, does not lure the flies in as great numbers as the beer.

FILING THE MOLARS

(*Continued from page* 92)

must be extracted. With this, the training of a saddle horse may go on unhampered.

The thorough-bred whose value depends entirely upon its speed is another class in which dentistry has been thought essential. It is, however, our experience that the actual benefit here is less pronounced than in other saddled horses. This may be due to the fact that in the mad dash of the race horse, a soreness of the mouth is not so much of a hindrance. The owners of such horses are, however, contrary minded and do actually demand that dentistry be practiced universally to all of their animals. Like in the other classes, the principal effort should be that of smoothing the premolars of both jaws.

In work horses there is less need for filing than in the classes above mentioned. Here and there, however, exceptionally long prongs wound the mouth and cause annoyance that only filing will correct.

As regards the modus operandi, each practitioner has his own system. Some prefer to operate without a speculum, while others prefer to protect their hands from abrasions by keeping the mouth open with one of them. The subject should be backed into a narrow confinement in all events to prevent backing away from the operator, and the head is best controlled by the dental halter. The ordinary halter interferes with free movements of the hands and instruments and should not be used. Where no dental halter is available it is better to have the head held by a good strong helper who places one hand on the poll and the other on the nose, keeping the head down at a comfortable angle for instrumentation of the mouth. The manipulations should be gentle—never forcible—and the float once in the mouth must be kept moving. It is the movements of the float that attracts the horse's attention and prevents opposition. When a float stops moving in the mouth, the horse first bites it and then endeavors to get away from the foreign object. Care is taken not to wound the gums by keeping the float at the proper angle and injury to the rear of the mouth is avoided by stroking cautiously over the last molars.

In filing the mandibular molars and the back maxillary ones the float should cut in the forward stroke, while in filing the maxillary premolars it is better to have the float blade set so as to cut on the backward stroke. This is, however, a detail of no great importance. To become proficient it is best, however, to practice the same movements continually. It is also advisable to follow a definite routine, beginning and ending habitually at the same arcade. This prevents omissions.

The instruments needed are two floats and a twelve-inch file. The floats are armed with rasp blades instead of files. Files are too slow and have no advantage, the twelve-inch file should be file on one side and rasp on the other. One of the float heads should be straight and the other slightly angled. The angle should, however, not be acute. An angle of ten degrees is sufficient.

The straight float is used to file the back part of the maxillary molars and all of the mandibular and the blade is set to cut on the forward stroke. The angular float is used only to file the maxillary premolars and cuts backward. The twelve-inch file is used to good advantage and is essential in "rounding up" the first premolars of each jaw. By learning to use it properly, it can be skillfully manipulated at different angles to affect a perfect smoothing up of these teeth after the floating has been done.

I haven't missed a number of the *American Journal of Veterinary Medicine* since the first, and do not want to. Each year adds to its worth, single copies being worth a year's subscription to any practitioner. I received "Lameness of the Horse" and think it worthy of a place in any veterinarian's library. C. A. HURLBUTT.

Stonington, Ill.

After looking through Lacroix's "Lameness of the Horse" I feel that it is a splendid addition to my library. S. W. BROWN.

Hamilton, O.

Queries and Answers

The editor will reply to queries appearing here, as he is able and as opportunity permits, but he does not want, nor cannot undertake to monopolize this portion of the department. Any reader who can furnish further and better information in reply to any query is urgently requested to do so. Where the treatments advised in these replies is adopted it is hoped that those employing them will report their results whether good or bad. In all cases give the number of the query when writing anything concerning it.

QUERY No. 274—I have a mare of my own, a grade Clyde, ten years old, that for two years slobbered periodically. There is, at least so far as I could observe, nothing wrong with her mouth or teeth. For three months now, when eating, the saliva absolutely runs from her mouth. Her manger and feed box are saturated. There is no odor from the discharge until it is allowed to accumulate with the refuse feed. At the present time she is being fed oat and pea hay. Of course, the mare is losing condition. I have failed to find a successful treatment. The glands appear normal and certainly the teeth are. Can you suggest anything? W. H. B. MEDD, V. S.

Salt Spring Island, B. C.

REPLY BY DR. L. A. MERILLAT—Among the pathological states which produce profuse chronic ptyalism in horses are lingual, dental, mandibular, maxillary, faucial and pharyngeal disorders. It is to these organs the diagnostician must look for some incriminating sign. Such a patient should be placed on the operating table or cast with ropes, and then after opening the mouth wide with a speculum the teeth should be inspected one by one with a steel pick, after washing them free from food particles. The jaws both within and without the oral cavity should be scrutinized for evidence of osteoporosis and for neoplasms, then when these are found to be normal the tongue is drawn out and with the aid of good light the fauces are given a good examination for polypoid growths, which sometimes dangle from them into the pharynx. If these examinations are negative, the hand must then be forced into the pharynx in search of a growth adjacent to the base of the epiglottis. The pillars of the fauces and the floor of the pharynx are points of predeliction for such growths. These are benign tumors, but are capable of doing just such harm as Dr. Medd describes. They are sometimes attached to other parts of the pharynx or even to the larynx, but in such cases always produce as a pronounced symptom noisy respiratory sounds while eating. As this conspicuous symptom is not mentioned, I assume it is not in evidence, and therefore speak only of growths at a point where they are no impediment to respiration.

Whether the food is well masticated or not and whether or not any of it is rejected into the feed box with the copious flow of saliva is not mentioned. There are bad cases of profuse ptyalism that are caused by bilateral facial paralysis. In these cases, however, it is saliva-soaked food that falls back into the feed box and not saliva alone. The patient, having no control over the lips and buccinators, is incapable of passing the food back into the fauces to prevent it from becoming over-soaked, and in the hungry state will partake of more food than the paralyzed mouth can carry back. The pathognomonic symptom of this state would be found in the flaccid condition of the lips.

Ptyalism from eating certain feeds would, of course, be excluded by observations on the other animals' feed in the same way as the patient. This is, however, never the cause of such a chronic slobbering.

Treatment: Diagnosis must precede even a hint as to what can be accomplished to effect a cure.

QUERY No. 275—I was called to see a mare, seven years old, nursing a colt; temperature pretty nearly normal, pulse 50, respiration 16, appetite fair. There was a slight serous discharge from the eye, also from the nose. A soreness was present in the region of the larynx. A diagnosis of shipping fever was made. A week later this mare could not control her hind quarters. She seemed to sway from side to side, especially in the hind quarters, as if she were going to fall. What is the last mentioned condition, and what is the treatment?

REPLY BY DR. J. F. DEVINE—The semi-paraphlegia which you speak of, associated with or as a sequel to influenza, has been rather a common occurrence, particularly in the East, during the past year. It is evidently

an affection of the motor nerves of the spinal cord, and all cases so far as we know have recovered under nerve stimulants such as nux or strychnin and gentle exercise in a large box stall or paddock.

QUERY No. 276. A large, fat Shorthorn cow, arriving by freight, walked out of the car apparently normal. From all appearances, she was due to calve in a day or two. She lay down and could not rise; temperature 102.4 at 9:00 a. m. She was treated for being exhausted as a result of the long train trip. She would not eat and would not try to get up. Occasionally you would think she had milk fever. She died at 10:00 p. m.

REPLY BY DR. J. T. DEVINE: The symptoms you give suggests either one of two ailments; parturient paresis or vacuity of the rumen, described by Friedburgh & Frohner.

The treatment indicated would be stimulation if the animal can swallow and by all means inflation of the udder as both conditions are probably referable to anemia of the nervous center.

QUERY No. 280.—Can you give me a remedy for "crazy sore neck" in horses without operating? I have a client with a dangerous case and he wants something done right away. I have never treated such a case, and as the horse is valuable, I don't want to blunder.

REPLY: In "Special Veterinary Therapy," page 25, under "Hyperesthesia of the Neck," Dr. Steffen gives the following:

"This condition, sometimes termed "crazy" sore neck, is well known among veterinarians and affects only work horses. It appears in two forms; one in which the neck appears to be only slightly sore at the collar seat; the other, in which there is a plug or wedge of necrotic, dry tissue in the center of the region. The first form is the most difficult to terminate. The horse, when an attempt is made to put on the collar or take it off, becomes literally crazy; he attempts to kick, strike, rear up or bite; in many cases becoming well night unmanageable. While these cases usually begin with an ordinary "sore neck," the animal seems to retain his "crazy" disposition even after the parts have been healed up and no trace of "sore neck" is evident.

"The second form, in which there is present a plug or wedge of dead tissue, is easily brought to a favorable termination. Surgical removal of the dead mass (which usually has the appearance of horn and may be several inches in length and imbedded deeply) and then treatment of the wound puts an end to the trouble.

"In the first form, however, there seems to exist a genuine hyperesthesia of the neck region and a severe underlying dermatitis is always present. The only evidence thereof is a slight fullness or thickening, with local heat. Occasionally cases of this form occur which are only cured after the animal has been given a protracted rest from service in the collar. It is possible sometimes to accomplish much by substituting a breast collar.

"Cases in which the horse shows no especial vicious disposition, usually terminate favorably with a few weeks' treatment with Prof. A. H. Baker's "toughening lotion." This is applied two or three times daily with the hand, thoroughly painting the entire collar seat with it. It is made by dissolving two ounces of tannic acid in six ounces of dilute acetic acid and two ounces of powdered alum in six ounces of water. Mix them and it is ready for use. A zinc-lined pad should be used for these cases.

"In the more desperate type of these cases, in which the foregoing treatment has not accomplished anything, an entirely different procedure is necessary. The deep, underlying dermatitis in such cases is not benefited by topical applications. From various salves, lotions and other treatments which have been applied, the epidermis has assumed a tough, pachydermal character and local treatment is useless. Such cases are cast, either on the ground or table, and the epidermis is shaved off the entire region with a sharp sage knife. Oozing of blood must be the guide for the depth of the shaving. It is well to have several sharp knives at hand. When the shaving process has been thoroughly gone through, having paid special attention to the bottom of the folds in the skin, the entire region is swabbed with mild bichlorid solution until all bleeding has stopped. This is important; all bleeding must be stopped before the next step is undertaken. Having previously made a saturated solution of iodoform in ether, which should be contained in an atomizer, the whole bare area is freely sprayed therewith; it dries at once and leaves a solid coating of iodoform. This is allowed to remain for twenty-four hours, after which it is washed off with ether and the neck is then treated daily with the toughening lotion as given above for ordinary cases. This method is nearly always successful. In horses that are naturally mean or vicious, a variable period may elapse even after this treatment before they are again entirely docile in this respect.

"In occasional cases good results follow the internal administration of Fowler's solution in small doses for a prolonged period. A zinc pad does much good in all cases. The use of deer-skin and other hairy or woolly pads should be discouraged on general principles because they are insanitary and almost impossible to keep clean."

Department of Live Stock Poisoning

By L. H. PAMMEL, Ph. D., Ames, Iowa
Professor of Botany, Iowa State College

It is the intention of the writer to use these columns to discuss the subject of poisonous plants. I shall, therefore, be glad to have readers of the American Journal of Veterinary Medicine send specimens of alleged poisonous plants to me. The queries will be given prompt attention.—L. H. P.

Moldy Silage

I HAVE two letters on my table in regard to red and moldy silage; one from L. M. Carl, Agricultural Instructor, Lone Tree, Iowa, addressed to the Veterinary Division, and another to me from Walter Herren of Storm Lake, Iowa. Mr. Carl writes as follows: "I am sending a package of silage taken from one of the farms here. It seems to have a serious effect upon steers in the feed lot. One steer became suddenly sick and died as a result, supposedly from getting too much of this mold. This mold seems to be scattered quite evenly through the silo, especially about one foot inside from the frost line. The silo is made from cement staves and there are no leaks that can be noticed." Mr. Herren also states that the moldy silage came from a cement stave silo and that the moldy silage was distributed through the silo.

Complaints about silage poisoning are not infrequent in the northern states. Silage is such an important food for livestock that we should not hastily condemn its use. Too much emphasis cannot be placed on the importance of feeding silage, free from moulds of all kinds.

The history of silage poisoning is briefly this: In my Manual of Poisonous Plants this statement is made by Dean Stange: "Two outbreaks have come under our observation during the past year. The first consisted of eleven head of horses. Two horses were being fed for market, the others were fed in the same manner during the nights and turned out during the day. The first animal affected was one being fed for market. It ate part of its feed in the morning, but in a few hours showed symptoms of ptyalism, depression and paresis of the hind quarters. By noon the animal was down, unable to rise and struggling some, and died that night. The next animal to show symptoms was its mate. The symptoms shown in this case were similar to acute cases of the so-called cerebro-spinal meningitis, coming on with trembling and weakness, causing the animal to stagger. An early symptom in all cases coming under our observation is the ptyalism due to inability to swallow (dysphagia). As a result the saliva collects in the mouth and hangs from it in strings. Muscles of different regions of the body are liable to contract. The breathing is rapid and in some cases may be of the Cheyne-Stokes variety. The temperature in this case was sub-normal. In some of the more chronic cases and when the animal has been down for some time with considerable struggling the temperature was somewhat elevated. The pulse was variable, being about normal in some cases and rapid and almost imperceptible in others. The animal became quite violent at times and finally died, living but a few hours longer than the first animal. The other seven animals showed a more chronic course, showing inability to swallow, slow, weak pulse, difficult, noisy respiration, weakness and paralysis, spasm of muscles of head, neck and back, death taking place in from two to six days. The other two animals showed a mild type of the disease, as slight loss of control, some exophthalmia, loss of appetite and thirst and loss of condition. These animals were placed on potassium iodid and nux vomica and recovered.

This outbreak was attributed to moldy silage which was being fed to the horses, but in order to be more certain, 150 pounds of silage were shipped to the college and fed, first to one horse which died in two days from an acute form of the disease. Another horse was fed but would not eat the silage so well, consequently did not die quite so soon, living for several days. In both cases the symptoms resembled those seen in the original outbreak. Post mortem revealed no changes except a few petechia along the small intestine, a few infarcts in the kidney and slight softening of the brain. This, however,

was not very marked, probably due to the fact that they were acute cases. Microscopic examination revealed the presence of mold in the mucosa and submucosa of the intestine, also mycelial threads growing between and around the renal tubules."

Since this was written numerous complaints have been made to the writer. Several interesting cases were reported to me by Dr. Beaumont. I am told by Dr. Bemis, acting dean, that cattle are not generally subject to this silage poisoning.

In both cases the mold found in the silage proved to be one of the Sac fungi (*Moancus purpureus*) which is closely related to the yeast plant. The red mold is not pathogenic. It no doubt secretes a toxic substance that causes the poisoning. I am not suggesting the method of treatment which must be left to the veterinarian. I want to emphasize the importance of discarding moldy silage. The farmers should use more care in keeping the air out. The fungus grows best where air has access to it. Are not some of the silos poorly constructed? Should not the farmer be more more careful in putting up silage?

PLANTS POISONOUS TO SHEEP

Dr. E. T. Baker of Moscow is the author of a work on sheep diseases forming No. 12 of the Veterinary Medicine series edited by Dr. D. M. Campbell of this Journal, Section 13 of this work treats of poisons. Dr. Baker says: "Closely approaching in extent the losses among sheep due to parasites are the losses from poisoning." The importance of poisoning from various causes has long been recognized by veterinarians and others experienced with range conditions. The subject of poisons is therefore of fundamental importance to the veterinary profession. The subject matter in the treatise before me is discussed under the head of "Mineral, Vegetable and Animal Poisoning." Mineral poisoning is discussed under eighteen heads, some of these not infrequent in regions where sheep occur, such as alkali poisoning and sheep dip poisoning. The author gives some excellent advice to sheepmen such as "Keep off the range until the grass is abundant." The variation of poisonous properties of different plants are noted at different seasons of the year. There are some good suggestions in regard to emergency treatment. The author gives the common and botanical name of the more important poisonous plants of the sheep range. Each species is described, symptoms of poisoning and treatment. Some of the plants given are death camas, loco, larkspur, lupine, aconite, choke cherry, veratrum, woolly loco, woody aster, sneezeweed, rubberweed and cowbane. There are six excellent colored lithographic plates of the most important poisonous plants of the range. These plates should enable anyone to recognize these plants. The book of Dr. Baker is an excellent one and the chapter on poisons has received excellent treatment. Every veterinarian should have a copy.

A HANDBOOK FOR RANGERS AND WOODSMEN*

J. L. B. Taylor, one of the forest rangers of the U. S. Forest Service, is the author of this work intended to serve as a guide for inexperienced men in woods work; while primarily intended for rangers on the National Forests, but it may be of service to those who go to the mountains for recreation. The subject of live stock is treated quite fully. Some seventy pages are devoted to the care of various animals, horses, cattle, sheep, and some of their diseases. Under the head of "Miscellaneous," various topics such as antiseptics, malaria, dysentery, snake bite, catfish wounds, and poisoning are discussed. Some eight pages are devoted to poisoning and poisonous plants and *that is the reason for this note.* Sixty-one poisons are given, in which the symptoms and treament are given. No attempt is made to treat the subject of poisonous plants, only a few are mentioned and a more detailed account of poisoning from poison ivy and the treatment for the same. The book is splendidly illustrated and the work will prove of great value to those who wish to camp in the forests of the west.

POISON

Some of the readers of the American Journal of Veterinary Medicine may not have access to the Encyclopedia Britannica (11 Ed.) Sir Thomas Stevenson, who wrote the article on poisons, states: "There is no legal definition of what constitutes a poison and the definitions usually proposed are apt to include either too much or too little." He recognizes the difficulty of classifying poisons and the best classification is that which groups the various poisons according to more obvious symptoms which they produce. Then he classifies the poisons into: (1) corrosive, (2) irritant, (3) neurotics and (4) gaseous poisons. The most important of the corrosive poisons are corrosive sublimate, material acids, oxalic acids and alkalis. Under irritant poisons, arsenic, lead phosphorus, vegetable irritants which produce drastic purgative effects and cantarides; under the head of neurotics, hydrosyanic acid, opium, strychnin, aconite and belladonna poisoning; under gaseous poisoning, chlorine, hydrochloric, coal gas, hydrogensulphid and anesthetics.

You are to be congratulated on giving the profession a publication such as the *American Journal of Veterinary Medicine,* without which no up-to-date veterinarian can afford to be.

Ellinwood, Kans. J. R. ZECHA, D. V. M.

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*John Wiley & Sons, p. 1-420, *f* 1-243, 1917.

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the thanks of the editor, the approval of the veterinary profession and the lasting gratitude of those who are aided by your suggestions.

Artificial Impregnation

EVERY veterinarian practising in a breeding district is frequently called upon to prescribe for some sterile mare or impotent stallion, and when inquiries are made into the history of the case, he generally finds that the sire has been used for service more frequently than is consistent with good judgment. In the section of the country where I practice, the weather has much to do with the horse breeding business, especially when it is unsettled, as it was last spring. On fine days, the farmer would be working in the field with his mares whether they were or were not in heat, but on rainy days, or when the weather would not permit field work, all the mares in season and some out of season, were brought to the stallion. As a consequence, since stallion owners are only human and desire to do all the business they can get hold of, they are apt to crowd their horses too much on rush days.

Advantages of Artificial Impregnation: Artificial impregnation makes it possible to extend the usefulness of a good stallion to many more mares without the danger of rendering him impotent by too frequent service, and a much larger number of patrons can be accommodated without disappointment.

Another advantage is that some mares that either from nervous temperament or malformation of the neck of the womb, are hard to breed from a natural cover, can be bred very easily and more surely by manual insemination.

Probably the advantage of most value to breeders is that their mares can be bred successfully when they are not in heat. Some claim that breeding mares out of season is even more successful than when they are in season. Also it allows the farmer to attend to his crops when the weather permits and to his breeding when rain would prohibit field work. The most common excuse that farmers have for breeding to a poor stallion is that he is more convenient.

The time of day that I prefer to do this work is early in the morning, just as soon as possible after daylight, since there is then no sunlight to do any harm and less dust flying around. I select a sheltered place, especially if there should happen to be cold winds blowing, as I believe that the semen should be kept as near the natural temperature as possible; in fact, it should not vary more than one degree either higher or lower.

The articles used are a Suterland impregnator, a small pan or bowl, some powdered slippery elm bark, a pail of warm water and a floating dairy thermometer.

I select a gentle mare, examine her, and dilate the os if necessary, and also examine the other mares if I have any reason to suspect any disease or abnormal condition. I then let the stallion serve the selected mare, having an attendant holding the pan ready to catch any semen that may be discharged when the stallion dismounts. If any semen should be caught in the pan, I endeavor to maintain its temperature by letting it float in the warm water. I then proceed to fill my impregnator and insert it into each mare in turn, having previously anointed my arm with the slippery elm bark.

If no semen is discharged into the pan, I immediately insert my arm into the mare

that has been served, load the syringe with the semen, which is usually found in the vagina or neck of the womb, and transfer it to the other mares in turn. This is the most satisfactory way as there is less danger of killing the spermatozoa by any change of temperature. There are many devices on the market for doing this kind of work, but I believe the simplest paraphernalia is the best, the principal objects being to avoid contamination and any change of temperature. Therefore, the most rapid way is generally the most successful.

The largest number of mares I ever bred at one service is eight, but occasionally I could have bred twice that number owing to a more copious discharge of semen. To show good results in artificial breeding, a stallion should not be used too frequently; I believe that forty-eight hours should elapse between services. I consider the number of successful fecundations to be about sixty per cent. My failures, I attribute to improper facilities for doing the work, as it is not always possible to get weather and surroundings just favorable.

Eureka, Ill. JAMES SMELLIE, M. D. C.

NO HEED GIVEN THE TUBERCULIN TEST

During September 1912, I made a tuberculin test on three cows belonging to a minister of this city. One of the cows showed a slight reaction to the test, and I advised the owner to have her retested in six months, but during

this time, she was sold, and I lost trace of her.

In January of last year I was called to see a sick cow owned by a Mrs. Ward. On account of the cow's condition, I did not recognize her as the preacher's cow. My diagnosis was tuberculosis and I advised testing her. Again I applied the intradermal test, and again the reaction was very slight. Eight days later, I gave her the thermal test and had a decided reaction. I performed tracheotomy and obtained bronchial secretions which showed many tubercle bacilli. Destruction was advised, but the owner flatly refused.

One month later the cow died of an advanced case of tuberculosis. The autopsy showed the lungs to be slightly affected, liver very badly so, and the spleen was almost a mass of pus. The accompanying illustration shows the condition of the cow while she was still giving a little milk, which was used by the family. Two weeks later I found out that she was the same cow tested for the preacher three years and five months previously.

CURTIS L. IVEY.

San Marcos, Texas.

DEATH FOLLOWING A UTERINE DOUCHE IN UNSUSPECTED ABDOMINAL PREGNANCY.

November 27, 1916, I was called to treat a registered Holstein cow for sterility. She had aborted September 15, 1914, and retained the afterbirth, and had a bad vaginal discharge for some time. She was served by the bull April 16, April 7 and May 27, 1915; and January 7, January 26 and March 17, 1916.

DIAGNOSIS: I made a rectal examination; found the uterus and the horns abnormally large; could feel hard nodules in the uterus, which felt like cotyledons, but as the last breeding date was eight months previous and as this cow was dry and did not show any enlargement of the udder and, further, as I was not able to feel a calf, I diagnosed the nodules as tumors of the uterus.

I told the owner that I did not think there was any chance to cure the sterility, but as I was treating some other cows for him that were sterile, by douching the uterus with a two per cent Lugol solution once a week, he said he would like to have me try the same treatment on her.

December 2, 1916, I douched her with two per cent Lugol solution and found that the solution ran very freely into her uterus, more freely than any other I have ever treated, and as I considered her uterus in bad condition, I ran about six quarts of the solution into her, but when I tried to siphon it out, I found there was no return flow. This

puzzled and alarmed me, but at the time it did not seem to affect the cow.

On December 4, 1916, I was called to see this cow and found her bloated. I tapped her and found the bloat in the abdominal cavity instead of the rumen. At first I got some gas and afterwards a dark brown, fetid liquid. I diagnosed the case as peritonitis; made a rectal examination and could feel a calf. I told the owner the cow would die and that she had abdominal pregnancy.

The cow died at noon. On autopsy I found a rupture in the infero-anterior part of the uterus between the horns, a badly decomposed calf in the abdominal cavity with the fetal membrane attached to the cotyledons in the uterus, and also some adhesion to the bowels. A very remarkable thing about this case is that this cow, with a badly decomposed fetus in the abdominal cavity, seemed to be in perfect health and very fat. After the cow was dead, I talked with one of the hired men, and he told me that this cow was in the habit of jumping fences and that in May or June she showed signs of "making bag."

M. D. Elzinga, D. V. M.
Grand Rapids, Mich.

MULE USES CRUTCH AND RECOVERS FROM COMPOUND FRACTURE OF METACARPUS

The accompanying illustration shows a mule with a broken leg set in the ordinary way with plaster-of-paris bandages and placed on a crutch. The mule was owned by D. A. Slaughter, Mitchell, Va., and in a runaway on July 27th broke its right foreleg about two inches below the knee. I was called the next day and found the break to be an oblique one, a sharp point of bone that had punctured the skin in one place.

I cleaned the part thoroughly, using as antiseptic a solution of Therapogen, 25 to 100. I then applied absorbent cotton, one layer, and all the dusting powder that would adhere to the leg. Following this I put on the bandage.

The crutch is made of 2x4 with trough square made of three-inch gate slats nailed on the inside of 2x4 and padded. I put the collar and harness on the mule with crupper to keep the collar in place. I bored a hole in the top of the 2x4 and wired it to the hame,

putting a leather strap above the knee and around the 2x4. A rest was built in the stall so the mule could not lie down. He was left in the stall six weeks. The picture was taken when the mule was removed.

On account of the danger of cutting by the sharp points of bone when shifting position, I believe the crutch saved the mule, which is now at work. The crutch is easy to make and apply and affords more rest to the part than anything I have tried.

Gordonsville, Va. H. S. WILLIS.

ALL DISTOCIA RECORDS BROKEN.

In the November issue of VETERINARY MEDICINE, I was attracted by an illustration and article regarding a thirteen-months-old parturient cow, the same being a Jersey heifer. Now I think that I have had a case of that kind which will beat it for a record.

On March 28th, 1916, I was called out of bed early in the morning to answer the telephone. The first call was for a trip of about fifteen miles. Five minutes later I was again summoned to the telephone. In this case the farmer had a young heifer that was having trouble and wanted me to come immediately. I told him that I had an urgent call ahead and asked him to wait or get some one else if he could not do so. The owner decided to wait on me, if I would hurry up with my first call. The roads being somewhat muddy, I decided to go with a team. By the time I got back from the first call it was the middle of the afternoon, and I arrived on the scene of my second case expecting to find the owner somewhat exasperated. Instead, everything was lovely except the case in hand.

The patient was a black angus heifer (pure bred). On inquiry I was amazed to have the owner tell me that he had records to prove that the cow lacked two weeks of being a year old. She looked it, for I don't believe that she weighed over 450 lbs. If any one would have told me that anything like it could be possible, I would have disbelieved him, but here was the evidence before me.

On examination, I found that it would be impossible to deliver the calf by the usual methods, either dead or alive or in pieces, owing to the smallness of the pelvic canal. The heifer had been straining so much that partial paraplegia had set in and she could not rise. I was at a loss to know what to do. I hazarded an opinion Cesarean section might be performed. The owner immediately took me at my word and asked me to perform the operation, because he had heard of me having some success with the operation on sows. I reluctantly consented to do it, although I must say that I did not want to do it.

On examination of my grip, I found that I was clear out of silk and had only enough catgut for peritoneal sutures. I forecasted the end of an otherwise difficult operation with a sinking heart. What must I do without sutures? It was five miles to town, and I was driving a team. I would have to sew the muscles and skin with common twine. This I did, first soaking the common grocers' twine in iodin and then proceeding. The operation was performed without anesthesia of any kind, and it was over in an hour and a quarter.

I left the farmer after extracting a live calf for him and told him that it might take the cow two days to get up, but I was hardly out of sight when the animal got up on her feet. I returned on the third day to find the cow and calf doing well. Other than the fact that it took the skin incision about a month to heal, no further developements occurred, and the cow and calf never missed a meal, and both sold for a good price at a sale about six weeks ago. Now, what do readers say? Does this beat the record?

I naturally expect a whole lot of criticism of my article, but I should never have taken this opportunity to speak on my own achievements if some one else had not written the other article to prompt me. I should never have thought much about my results in this case had not comparisons shown my achievements to have been greater.

Of course, I realize that our texts on surgery do not have much praise for Cesarean section in the cow or larger animals, but nevertheless, there are cases where we are better off to try something of the kind in the cow. My results so far in cattle have been about 50 per cent successful with this operation. I have never tried it in the mare and do not believe it would work on account of danger of peritonitis.

Technic of Operation: Shave the hair or clip it from the entire flank, either left or right (better the right flank). Scrub thoroughly and paint with tincture of iodin. Then make an incision about twelve to fifteen inches in length straight through the skin and muscle down to the peritoneum. Pick up the peritoneum, incise it and locate the uterus. Palpate the uterus until a foot or leg is located; then grasp the leg with a firm hold; introduce the other arm and hand and draw the uterus up to the mouth of the wound. Have an assistant with clean hands grasp the womb by the same method and fix it at the opening of the wound. Then incise the womb about twelve twelve or fifteen inches directly down on to the fetus. Reach in and grasp the

calf by the leg and have your assistant grasp the edges of the incision in the womb and elevate them so that no fluid can enter the abdominal cavity. The rest is comparatively easy. Remove the fetus as carefully as possible. Suture the womb with silk, turning in the peritoneal surfaces. Suture the peritoneum with catgut, the muscles and skin with silk. It takes great care to prevent some of the contents of the uterus from spilling into the abdominal cavity. To prevent this, clean towels may be laid around the mouth of the wound in the abdominal wall.

It is preferable to use anesthesia, but the operation can be performed without, by tying the front feet forward and the hind feet backwards to posts or studdings. Stimulants can be given before and after the operation and go a long way towards preventing surgical shock.

Mt. Sterlin, Ia. C. F. Neis, D. V. M.

AZOTURIA OR FORAGE POISONING?

I was called to see a gray grade Percheron mare, four years old, in fair flesh, that was down in a wheat field near a straw stack. The history was that the mare had been on the wheat pasture about three weeks, had received no grain or hay, had not been in the barn during this time, and was always rather sluggish. The owner stated that he had been away from home the day before and on returning home had found this mare down in the center of the straw stack covered with perspiration. After about three hours' work, he and some of his neighbors rolled her out of the stack and covered her up, thinking she was tired out and would be up in the morning.

When I arrived, about 9 o'clock, I found the pulse 78, full and tense; temperature 102° F.; respiration 48. She was very nervous with twitching of the muscles over different parts of the body. The gluteal musculature was swollen and very hard. Peristalsis seemed to be normal. She made frequent attempts to get up but could not support any weight on the posterior limbs. The urine was of a dark coffee color and retained even during her struggles. I could find no external cause for the swelling of the gluteal muscles and no injury to the vertebra, so gave a diagnosis of azoturia and a guarded prognosis.

I gave lobelin sulphate to control the nervousness, a purgative and 15 c. c. of digalen subcutaneously. The mare died in about three hours after I left, and I did not hold an autopsy.

Was my diagnosis correct? Did the exertions of this mare while in the straw stack bring on an attack of azoturia without the usual period of rest with high feeding seen in most of these cases? Was the treatment correct? Should I have used slings in this case? I hope that readers will discuss this case for me.

Cherokee, Okla. F. F. Meads, D. V. M.

A FEW NOTES ON 800 CASES OF PARTURIENT PARESIS

The writer having treated over eight hundred cases of parturient paresis in cows during the past fifteen years, and although not having discovered anything new as to the cause or treatment, would like to offer a few suggestions which might be of interest to the new practitioner or some who may be located where they have a limited experience with this disease.

Being now located where six or seven cases a year is the average, and having practiced in a field for ten years where eighty cases a year was the average, it appealed to me how easily the man with only a few cases a year can become alarmed and possibly overdo the job where there was not any need of doing so.

During my first few years of practice, the Schmidt treatment was used almost entirely with varied results. The percentage of recoveries with this treatment was not nearly as great as now with the air treatment and the complications were far more numerous. Many would gain their feet only to die in a few days from pneumonia. Others would recover and have mammitis, eventually the gland function being lost. These were the greatest faults of Schmidt treatment.

The next treatment that I used was trikresol treatment advocated at the time by Dr. S. Brenton of Detroit. This treatment consists of trikresol and glycerin, equal parts; two drams of this mixture in a quart of lukewarm water and distributed equally in the four quarters of the udder. This treatment gave excellent results with no complication, in fact it proved the next best to the air treatment.

For the past several years we have had the air treatment, which by all odds is the best, and although something may be discovered which will prove as satisfactory, I feel sure there will never be any that will effect a greater percentage of cures. The results from this treatment have been so favorable that many seem to think all that is necessary is to inflate the udder of a cow with parturient paresis and she will recover. Granting that this is true in the majority of cases it is for the few that will not, that we make these few suggestions:

First—Position in which the patient is kept during the attack is almost as important as the air treatment, as the cow whose

udder is inflated and then allowed to remain lying on her side as they do in a comatose state has little chance for recovery. The very first thing when you arrive to a case of this nature roll patient upon her sternum and keep her in that position during the time she is unable to stand.

Second—Give one-half grain of strychnin sulphate subcutaneously, never more than one-half grain as, in my opinion, the practitioner who gives over one-half grain of strychnin in this manner for his first dose to any cow in any condition is flirting with disaster and some day will find himself in an embarrassing position. The bovine does not tolerate styrchnin as well as the equine, in fact, many seem peculiarly susceptible to its action. Some veterinarians prefer atropin to strychnin. Personally I prefer the strychnin except in those cases where the patient seems very excitable or a case that occurs on a hot, sultry day. Cases on such days are always more serious and deserve a more guarded prognosis.

Third—Inflate udder after washing the teats with some good antiseptic in the water. It is not necessary to milk as there is very little milk in these cases. Do not tie the teats as by pressing the end of the teat and holding for a few seconds, air will cease to escape. In connection with inflating the udder I wish to say a word regarding the larger bicycle pump as an instrument for this purpose. Several veterinarians who pride themselves on using a bicycle pump in these cases have come under my observation. This practice should be discouraged for two reasons in particular. First, the bad impression that it leaves with your client. Second, the danger of injury to mammary glands. Hemorrhage within the glands has been known to occur following the vicious use of a large pump. It is impossible to inflate the udder too much with a small bulb outfit. The cylinder of a bulb outfit should contain absorbent cotton dampened with a few drops of trikresol or other suitable antiseptic. I have had a couple of cases die while in the act of inflating the udder. For this reason it seems best to administer strychnin before the air, since following this procedure I have never had such a misfortune occur. It would occur very rarely but safety first seems in order.

Fourth—If placenta membranes are still retained remove them, which, in my experience in these cases, is always easily done, in fact, the membranes are generally detached from the cotyledons and are lying in the uterus.

Fifth—Instruct the attendant to keep patient in proper position and not to touch the udder in an attempt to milk until she has been on her feet and apparently normal in every way for at least three or four hours. Not to give or allow to be given any drench of any kind, as there is danger from such a procedure, during and for forty-eight hours after a severe attack.

The muscles of the neck and throat seem to always be affected in this condition. Be sure and give a guarded prognosis in those cases that have been drenched before your arrival.

If the patient has not regained her feet in six to eight hours after treatment the attending veterinarian should be notified and treatment repeated.

Occasionally you meet a case where everything returns to normal but patient refuses to regain her feet. The temperature, pulse, respiration are normal, patient eats, drinks, ruminates, all in a normal way. Sometimes this will continue for several days while every effort to make animal rise fails. One case of this nature in my practice crept around the yard eating grass for a week in spite of every effort to make her rise, until one morning the family found her walking around natural as ever. When this condition is met medical treatment seems of little use and mechanical methods no better, although it is well to continue the strychnin treatment. You may try for an hour to make a patient of this kind rise, leave the barn half an hour, and return to find her up as though nothing had happened. A good dog is sometimes of great assistance in cases of this nature.

I have not said anything regarding symptoms as that is well covered in works on cattle practice.

If called to a case in its earliest stage while animal is still standing and you are not satisfied that parturient paresis is developing grab the nose as though about to administer drench, elevate the head and the patient will fall and present such symptoms as will leave you in no further doubt. This trick is of no value to the practitioner of large experience with this trouble, but the young practitioner or one who has had a limited experience, is not always satisfied that the patient is about to go down. To these I would advise elevating the head.

In closing will state that I have never seen a case following birth of first calf, never a case following other than a normal birth, never a case with retained placenta that the membrane was at all firmly attached.

Many cows suffer an attack each succeeding year, others never have second attack, and some have attack every other year.

Relapses with air treatment are rare, but do occur.

No case is too far gone to respond favorably to proper treatment unless patient be dead when you arrive.

Alpena, Mich. A. A. MOTLEY, D. V. S.

AN EXPLANATION FOR THE OCCURRENCE OF DOUBLE MONSTERS

I want to call attention to the explanation of the double monster reported on page 43 of the January JOURNAL. Such monstrosities not infrequently occur in some of the lower forms which have no amnion and often occur in the vertebrates when the amnion is normal in every way. The generally accepted explanation of this condition is an incomplete division of the embryonic mass at a very early stage in its development. This would have resulted in true or homologous twins had the division been complete. The fact that this cow had formerly produced twins indicates, along with this monster, a tendency toward twin production. Such twins lie in the same chorionic sac and are therefore known as mono-chorionic. It is well known that certain individuals bring a high percentage of twins of the mono-chorionic type and in this case some unknown factor evidently operated to defeat nature's intent, to repeat the occurrence.

The case is a parallel to that of the famous Siamese twins, whose mother produced two or three sets of normal twins not joined as were their unfortunate brothers. Amnionic adhesions are doubtless responsible for some forms of monstrosity, but I believe had nothing whatever to do with this case.

Kansas City, Mo. R. F. BOURNE.

VENTRAL HERNIA IN A COW

History.—I was called on July 20th to see a Holstein cow. The owner claimed that when he purchased her she had a

"lump on her belly," and on July 19th, he noticed that the lump was "busted and turned wrong side to." Upon examination, I found the protruded mass to be mesentery in a necrotic state and containing maggots. I decided to operate.

Operation.—After the cow was cast on her back by means of hopples, the parts were thoroughly cleansed with a solution of carbolic acid. Two pounds of mesentery were removed. The edges of the abdominal wall were cleansed and scarified; the muscular wall sutured and then the skin, after which the parts were painted with tincture of iodin and an abdominal bandage applied. The cow made an excellent recovery and was sold recently at a sale for $59.00.

E. J. YOCUM, V. M. D.

Veedersburg, Ind.

SILAGE POISONING THEN ARSENIC POISONING

I was called to a plantation to see some mules, four of which had died the night before. They had been feeding on silage made from cane and had gotten down to where the silo had been filled with corn and six weeks later the cane had been put on top and the silo covered. The corn silage was mouldy and in bad shape. Three of the mules died that day, and the overseer took the stuff out of the trough. The mules commenced to cough the day before and the negro attendant thought they were taking the distemper and got some lime and put in the trough to cure the distemper. He wet the hay and sprinkled the lime on it so they would get it. The next day four of them died and the following day four more died. The next day, Friday, eight died, and the negro told us then that the lime he had given them he got from a keg on one of the other plantations. We investigated and found he had used arsenic instead of lime!

He put the silage out in the pasture and let the cattle eat it, and some of the cows died. I did not know that the cows had access to it until the first of the cows died, and the negro told us how she got the silage. I knew that the cows had been eating the silage, but did not have access to the lot given the mules. I knew they were poisoned the same as the mules, but until I found that the negro had taken the feed out of the mule trough and fed the cattle, I could not account for their being sick. Five days after the first died, there were thirty-eight mules, five horses and three cows dead, and the rest would be better off dead than alive. Not any of the antidotes for arsenic would work—it had run too long.

Hearne, Texas. W. N. MATEER, D. V. S.

LUXATION OF BOTH PATELLAS ACCOMPANYING STRANGLES

On December 30th, I was called to a client's home to see a three-year-old gelding that was "stifled." After replacing the luxated patella, which I did by merely extending the foot forward by means of a rope on the fetlock, I noticed a discharge from the nostrils, and upon examination, I found the animal showed a typical case of strangles.

This animal had not been worked for three weeks and had stood in the barn during all that time. I surmised that the luxation had happened while it was being led from the barn, there being an unusually high step at the door; but on visiting the barn the next day and finding the other stifle in the same condition and the first one apparently all right, I decided that the condition was due to the general disease and high fever.

Both joints responded to a blister and gave me no further trouble. In a week's time the animal had made a nice recovery.

McLean, Ill. L. N. MORIN, D. V. M.

EVIDENCE THAT AZOTURIA IS DUE TO AUTOINTOXICATION

In the January issue of the JOURNAL I read with a great deal of interest the article on Azoturia, by Dr. M. R. Steffen. There are a few instances in which I hold a different opinion than that given and perhaps the author or some of the readers can clear up these matters for me.

I believe that the disease is due to an auto-intoxication, or in other words, a toxemia. Dr. Steffen states that he does not think it is due to a toxemia, but, in number two of his form upon which he bases his theory he states that there is a hypernitrogenous condition of the blood.

If in his theory the blood is charged with an excess of nitrogeneous material this in itself would constitute a toxemia.

An excess of nitrogen is destructive to hemoglobin in that it causes a separation of hemoglobin from the corpuscle and is eliminated as waste by the kidney. This elimination of hemoglobin by the kidneys is shown by the highly colored urine.

The action of nitrogen on the hemoglobin is probably also the cause of the viscosity of the blood. In my practice I have observed on numerous post mortem examinations that the blood does form clots, but there seems to be an excess of fibrin and a small amount of hemoglobin present.

In one or two cases I found on autopsy large fibrinous formations in the heart and also smaller ones in the arteries; these were of a chicken-fat color and very elastic in consistency. Form all appearances these formations had existed for some time before death. In many cases I have found smaller clots in the heart, usually adhering to the valves and cordæ tendonæ.

Horses that have worked to the point where symptoms first appear and then are given rest usually recover. I think this is probably due to the fact that by this time the animal's respirations are accelerated and it is perspiring freely, thus eliminating a good deal of waste material and gases.

Through the accelerated respirations some gases are eliminated and oxygen is taken in much more freely, thereby giving nature an opportunity to restore an equilibrium of gases in the blood.

In a number of autopsies on carcasses that had died from azoturia I found some intestinal trouble and I have often wondered if this could not be the cause in many cases. Either a slight displacement or a complete torsion was noticed in such cases.

In all cases there was more or less impaction of portion of the bowel, usually the double colon. Again I have seen symptoms of azoturia follow pectoral influenza. Finding so many cases with intestinal trouble has caused me to believe that azoturia comes from an auto-intoxication and if one can keep up the patient's strength and get free elimination through all the emunctories, such patients will recover. In most of my fatal cases post mortem examination revealed displacement or torsion of some part of the intestine. I would like to hear from others on this disease as it is only by pooling our experience that we get anywhere.

W. P. BOSSENBERGER, D. V. M.

Williams, Ia.

INFLAMMATION OF THE DORMANT MAMMARY GLAND IN A MARE

On December 25th last, I received an early morning invitation to visit a gray mare, ten years old. Upon my arrival, I found her standing in a box stall and she was so stiff and sore she would figuratively "holler ouch!" when compelled to move. As I had broken all of my temperature pencils, I counted her pulse and guessed. The pulse was 60; visible membranes, slightly injected; left mamma, badly swollen. I prescribed fluid extract of phytolacca in ounce doses three times a day and the all-important embrocation to be applied.

The next day the swelling had extended nearly to the front legs. We continued the above treatment, and at the end of a week she had recovered. Whether it was the treatment or nature that did it, I am not sure. I did not make a diagnosis except a tentative one of mammitis. I never saw it in a mare before. She had not had a colt for two years.

Arrowsmith, Ill. JAS. HORN, D. V. M.

SEPTICEMIA IN MINNESOTA RESPONDS TO BACTERIN TREATMENT

About a year ago there were a good many cattle shipped into this community from St. Paul Stock Yards and sold to various farmers.

One of my clients advised me one morning that he had found two steers dead that had been ailing for two or three days and that several others were sick. I autopsied the two dead ones and found hemorrhages on the intestines and pericardium; these hemorrhages were petechial in nature.

There was a slight hemorrhage from the nostrils. The lungs showed a very intense pneumonic condition, showing some necrotic areas. The thoracic cavity contained a yellowish green gelatinous exudate and the pleura was intensely inflammed. With the history of these cattle coming from the stock yards I made a diagnosis of infectious pneumonia contracted in the yards and gave a treatment for the sick ones as for pleuropneumonia. I left with the understanding that I would be back the next morning.

It was a new one on me and being plainly up against it I immediately phoned Dr. W. L. Boyd at the University Farm asking him what the trouble was and the line of treatment. He told me that there was considerable of this disease in the stock yards and that they were terming it stock yards' pneumonia. But as to treatment he couldn't give me any encouragement. In the next four or five days I had several outbreaks of this trouble in different localities and as they were practically all affected were dying I had Dr. Boyd come and we did several autopsies and he took some specimens back to the laboratory with him. I dreaded to hear my phone ring as I seemed to meet this disease at every turn and I was unable to give an intelligent answer to the questions plied upon me by the various stockmen.

This trouble gradually died out and a short while afterwards Dr. Boyd advised me that he thought that the trouble was hemorrhagic septicemia.

I visited Kansas City a short time afterwards and explained the symptoms and lesions to Dr. A. T. Kinsley. He told me he was positive that the ailment was hemorrhagic septicemia, also that some veterinarian was treating a bunch of hemorrhagic septicemia subjects at the Kansas City Stock Yards with bacterins and that I had better investigate. Dr. F. F. Brown took me to the yards and succeeded in finding this doctor. He explained the disease and his treatment with bacterins quite vividly showing exceptionally good results.

I saw no more of this disease until a week before Christmas, 1916.

About nine o'clock one evening a stockman living nineteen miles from town called me up, asking me to come out as he had three cows he thought were poisoned. When I arrived at the farm, we went in the house to warm up; he then told me that he thought they were poisoned from eating hay cut from over-flowed meadows. I asked him if there had been any new cattle brought on the place lately. He replied that he had bought eighteen head at the stock yards in St. Paul, ten days previously and that one of these was sick.

On examination of this steer brought from the stock yards, I found the skin dry, back ached, evidence of considerable pain on moving, moaning constantly, slight mucopurulent discharge from the nostril, bowels somewhat sluggish, intense salivation, temperature 107.5° F., respiration 58, quick abdominal breathing, pulse 60. The other two sick ones showed practically the same symptoms, with the exception that the temperature was not quite so high.

I told my client that I suspected hemorrhagic septicemia and that only thing that would do him any good would be bacterins, that I would phone early the next morning for the bacterins and be out that night to inject them. The bacterins did not come that night. I phoned and found that they had been sent, but had undoubtedly been lost in the Christmas rush. I went out early the next morning, found three dead and three more sick. I autopsied the dead ones and found practically the same lesions I did a year ago. I told him if the bacterins did not come on the next mail I would drive to St. Paul after them. It didn't come that night, so I drove to St. Paul, got the bacterins the next morning and drove directly to this farmer's place. Upon arriving I found two more dead and five more sick. I told him we would give the sick ones an unusually large dose as three of them seemed beyond help.

I injected from two to three mil., according to size of the animal, to the remainder of the herd, numbering about fifty-five. To the sick ones, there were two very large cows, to which I administered five mil. each, and the three remaining were small steers to which I gave three mil. each.

I had him burn the carcasses, build a new feed lot and disinfect the barn as thoroughly as possible, leaving with the understanding that he should call me every day. He called me the next day saying that there were no new cases and that the five sick ones seemed slightly improved. The next day they were eating quite well and gradu-

ally improved to a complete recovery without any new cases in the herd after the injection.

L. B. MALLETTE, D. V. M.
Princeton, Minn.

AN AMBULANCE FOR COUNTRY PRACTICE

The ambulance here shown is a Smith "Form-A-Truck" attachment for a Ford car. The truck cost me $350.00 and I had the body made at home at a cost of $75.00, making a total cost of $425.00. I have a drop door at the rear end, and by throwing some litter on it, any horse or cow will walk right into it without any trouble. I have a ring in the floor near the front end, and once the animal is loaded and tied to this ring, there isn't any

way for it to get out. I can haul the largest of horses or cows and can make from twelve to fifteen miles per hour and have power enough to go over almost any kind of road with ease. As an investment, I consider this one of the best I have ever made in my line of work. I charge the same mileage for going after an animal that I do for making a call and I send my helper to do this work. There is scarcely a day but that I send the ambulance on one or more trips, and since people are finding out that I have it and will come for their stock, business is increasing.

S. B. MANNING, D. V. S.
David City, Neb.

CAREFUL UTERINE IRRIGATION FREE FROM DANGER

I notice in a recent article in VETERINARY MEDICINE, that the author condemned the practice of uterine irrigation in cows.

In seven years of practice in a section devoted almost exclusively to dairying, and where about two-thirds of the animals treated are milk cows, I have had the opportunity to observe results of this treatment rather extensively.

Because the farmers here breed their cows to calve in the fall and winter months when on dry feed, together with the fact that infectious abortion is rather prevalent, I think I am called to remove the placental membranes more frequently than to treat any other condition.

For years I have practiced the irrigation of the uterus in these cases and have not known of one death to result, nor observed one case where the results have not been highly satisfactory.

When possible I use water that has been boiled and strained through a clean cloth. I use an injection pump and stomach tube, allowing the solution to remain but long enough to reverse the pump and withdraw it. I am always careful to keep my hand over the end of the tube to prevent injury to the walls of the uterus. I flush out both cornua whether infected or not.

I have used, at some time or another, every antiseptic indicated in these condi-

tions, but have discarded them all for bichlorid.

I never use any of the coal tar derivatives. I have used bichlorid of mercury in solutions, varying from 1 to 1,000 to 1 to 10,000 and have had most excellent results from them all, although about a 1 to 5,000 is the best. I use from one to three or four gallons of the solution.

I have found that where the uterus is properly irrigated there will be no disagreeable discharge, as in cases where it is neglected. Further, the owner is more willing to call you when he sees you are doing something that his neighbor did not do when he "cleaned" his cow the last time.

Theoretically uterine irrigation is all right and it has certainly given most gratifying results in my practice.

I should be pleased to hear from the gentleman who has experienced unpleasant results from it, and know his theory as to the cause of death.

Minnesota. R. E. C.

MOLDY SILAGE KILLS ALL HORSES ON A FARM

The season of the year is at hand when stock owners will begin to feed ensilage, shredded fodder and shock fodder. Forthwith cases of forage poisoning will now and then engage the attention of the practitioner, and also to cause him some sleepless nights and gray hairs.

This is a condition about which very little has been told, though much has been written. There seem to be diverse opinions as to the causative agent, but it is a well-known fact that cows, hogs and sheep can be fed on roughage that horses cannot tolerate. As my experience has been with the horse, it is to this phase of the subject that I desire to call your attention.

Ensilage is very poor feed for the horse, because of its sourness, although they like it and will leave grain to eat it. At the best, it is unwise to feed it, much more so if the silo has been filled with dry corn or immature corn such as grows in shady portions of the field, i. e., in the edge next to a wood lot or under large trees, or ensilage that is taken from a silo improperly erected, one that has joints or cracks through which the air gets to the ensilage to form air pockets, favoring the growth of mold or other fungi.

The ingestion of mouldy ensilage or fodder when it results in forage poisoning, produces two types of the disease—a delirious and a comatose or condition of gradual paralysis. It is this latter condition that I shall describe. I had an opportunity to watch the development of this line of symptoms such as I never expected or hope to have again. Probably the best way to make the symptoms plain as I noted them would be to relate my experience.

On a Wednesday morning in January, 1915, I was called to see a four-year-old gelding that was sick. The chore boy had gone to the barn that morning to feed, and this horse was lying down and did not get up until forced to. He did not eat but remained standing until the boy's return from breakfast, when he lay down again and rolled slightly. The owner was called, and decided from the condition of the horse and stall that he had been sick for some time.

Upon examination I found that the bowels were rather dormant; very slight peristalsis; horse pawed occasionally and lay down, remaining quiet; pulse very feeble, rather full and soft; respiration accelerated but full and deep. I diagnosed the case as a partial paralysis or stagnation of the bowels due to overfeeding. I gave an aloetic ball, two capsules of turpentine, one of ether and a hypodermic injection of one-quarter grain arecalin and one-quarter grain strychnin. I followed this in three-quarters of an hour with a half grain of arecalin hypodermically. The patient showed no improvement for a considerable time, but did not seem in any great amount of pain or discomfort nor did he become restless.

After about four hours of "watchful waiting," I noticed the smell of aloes, and you can imagine my consternation when I discovered the horse breathing seemingly through his mouth and the aloes streaming from both nostrils. Two hours later the animal died. For an hour previously, he seemed to be suffocating; fought desperately for breath; could not get up on his feet; would raise up on fore feet or knees and at once fall over. I imagined that my capsules of turpentine had broken, irritated the pharynx, producing edema enough to close the larynx and had literally suffocated the horse. [Why didn't you resort to intubation if such was your belief at the time.]

I surely was in a "stew." The owner demanded that an autopsy be held, and I was game enough to "take my medicine." Imagine my satisfaction when I opened his pharynx, esophagus and larynx, and found neither capsules nor any structural change. In fact, I found not a thing during the autopsy upon which to base a diagnosis. Upon looking around over the barn and feed box before leaving, I discovered that he was feeding decidedly moldy ensilage to every horse on the farm. I advised him not to feed any more to his horses and left the place puzzled and disgusted with myself as a veterinarian.

The next morning, Thursday, at 5 o'clock, this man called again and informed me that the mate to the dead horse was sick, acting similarly to the one that had died. He remarked that we were "up against something decidedly wrong" and wanted counsel. I immediately called for Dr. Brobeck of Richwood and Dr. Stockwell of Mechanicsburg and then drove out to his farm without any regard for the speed laws.

Upon my arrival, I found the patient in the same condition as the one the previous morning. But I made haste slowly this time and gave him an ounce capsule filled with water. Dr. Brobeck arrived about twenty minutes after myself, and after relating to him my experience of the day before, I reached back in the patient's mouth and removed the capsule of water, convincing the doctor and myself that my supposition of a paralysis was correct. We passed a stomach tube with difficulty and injected several gallons of a strong saline solution and a dose of calisaya, iron and strychnin. He lay down in a few minutes and did not get up once afterwards.

The rest of the horses were out in the barn lot. While we were waiting developments, the owner and myself stepped to the barn door, and I noticed his driving mare walking around the lot in a rather peculiar manner and called the owner's attention to her. He at once pronounced her wrong also. We got her in, tried her on an empty capsule and she could not swallow.

Dr. Stockwell had arrived by this time, and after hearing the history and examining the gelding, pronounced his condition hopeless. We at once passed the stomach tube and administered a purge along with some stimulants, etc. We worked at least three hours with her after withdrawing the stomach tube, without obtaining any improvement in her condition. Our second patient died at 11 o'clock that morning under the same conditions as the first one.

We then brought the remaining two mares in, also a six-month's-old colt, and gave them an aloetic ball, all receiving the same dose. I noticed when administering the purge to the mares that they were drooling saliva, but thought it was due to the bad condition of their teeth, as they were rather aged.

Patient No. 3, the sorel mare, was up and down the rest of the day; did not roll nor paw; neither did she make any other disturbance. At 8 o'clock that evening, she was unable to get up on her feet with help, and at twelve, was not able to raise her head from the floor. She was entirely conscious, as she followed us with her eyes, watching every move we made.

A little after midnight, Thursday, one of the remaining mares began to switch her tail every few minutes, but continued to eat her hay. At 5 a. m., Friday, the chore boy came to the barn and fed the two mares and the colt while the owner and myself went to the house for a lunch. When I returned to the barn, I stepped in beside the mare that had switched her tail in the night and discovered that she had not eaten any of the fresh hay, although she had nosed it around, also that her corn was only touched. At once I led her to the watering trough, where she tried to drink but could not swallow a drop. It appeared that she was to be victim No. 4.

Patient No. 3 died at 8 o'clock that morning.

About the middle of the forenoon the mate to patient No. 4 began to act similarly to the way No. 4 had acted. She was victim No. 5. The colt was in and out of the barn all day until about 5 p. m., when he lay down and began to act peculiarly.

During the day we got two quarts of whiskey and gave the mares a pint at a time through the stomach tube; also gave them plenty of water. They became more and more paralyzed; would lie down for an hour at a time and then get up, but each time remained down longer and experienced more difficulty in getting up. The mares died at seven Saturday morning. They had received one-quarter grain doses of strychnin hypodermically every hour for twenty-four hours, as did also the colt, which latter was the only one that showed any physiological action from the drug.

After being in attendance on this farm from Thursday morning until Saturday forenoon without a wink of sleep, I gave up and came home. Of course, we did not lack for company as every farmer within five miles of the place came to "stare and speculate." The colt died Sunday morning at 8 o'clock, after being drenched with warm lard and oil by a non-graduate that came in to help after I had left.

I have not said much about treatment because we obtained no apparent effect from it and it seemed hopeless from the start. But I want to bring out these points in the symptoms—the salivation so long before any other objective symptoms were noticed; also that after twenty-four hours it ceased; the inability to swallow; the gradual creeping paralysis; the animals each time they lay down becoming unable to rise as readily as they had previously; the lack of a defecation for twenty-four hours before any pronounced symptoms were noticeable; the negative results from the purges; also the fact that the six-months-old colt received

a very heavy purge without any response; also that the colt was a privileged character, going in and out of the barn at will, stealing ensilage from every horse in the barn, from the sheep and from the cows, and he was the last to succumb to the disease.

Maryville, O. P. T. ENGARD.

BLACK TONGUE IN DOGS A DIETETIC DISEASE

I have seen the subject of black tongue in dogs discussed in the different journals, text books on veterinary medicine, and by the laity so often of late years that I have decided to give my views on this most destructive of diseases to which dogs of our southern climate are heirs. This disease is classed in most of our text books as ulcerative stomatitis and considered an infectious disease, although the specific organism causing it has not been isolated.

SYMPTOMS: When confined to the mouth and buccal membrane, there is indisposition to eat, a tendency to lie down most of the time, and severe vomiting. There is evident salivation, and on opening the mouth one may find the offensive, cadaverous odor. In mature dogs the teeth are covered with tartar. The gums are red or ulcerated and dark red patches of congestion, which after a time turn to a whitish yellow or gray may be seen on the lips, cheeks and tongue, next these areas become soft pulpy or mushy spots of disintegrating epithelial patches, and finally there is formed rounded ulcers. These are tender and bleed readily. There may be implication of the pharynx, the lymph glands, the nose, the eyes, the stomach, the liver, or the intestines, with corresponding symptoms. Death may supervene in from six to twenty-one days, or a more or less speedy recovery may take place.

DIAGNOSIS: The disease may be differentiated from rabies by the absence of paralysis of the muscles of the mandible and the coarse howling bark, which we have in rabies. Also there is not the desire to do mischief that we see in a rabid animal. While the under jaw is stiff in this disease, it does not show paralysis, this stiffness being due to the soreness from the inflammation and ulcerated condition of the mucous membranes, but the most characteristic symptom is the offensive cadaverous odor from the mouth. In the intestinal form, we see all the symptoms of an acute gastroenteritis, with liquid, blood-stained feces and later constipation. While there is fever as is indicated by the ardent thirst of the animal, the temperature very rarely goes more than two degrees above normal, and before death, usually drops to sub-normal.

ETIOLOGY: The direct or exciting cause of this disease is, in my opinion, a ptomain poison or food poison due to eating fermented food or food in a state of putrefaction, or to an autointoxication. The lowering of the general health following other diseases such as distemper, rachitis or indigestion, must be recognized as a predisposing cause. This is classed as two entirely different diseases by Dr. H. B. F. Jervis of Columbia, S. C.—the one affecting the mouth, as necrotic stomatitis, and the intestinal form, as gastroenteritis, but I cannot accept this theory as I have seen numerous cases where the mouth was affected and at the same time the stomach and intestines were affected, and all of the post mortem lesions as described by Dr. Jervis of the intestinal form were present. Therefore, I regard it as one and the same disease with different manifestations. I admit we may have the gastroenteritis without ulceration of the mouth and vice versa, but I have seen too many cases affected from the mouth to the anus to make me believe we have here two different diseases. Besides, while living in Illinois, I have seen a great many cases of stomatitis of a catarrhal nature in dogs, but this never develops into such a deadly malady as what is called black tongue in the Southern states.

PROGNOSIS: Some seasons the disease appears to be more fatal than in others, and worse in summer than in cold weather. Some fifteen years ago, when I began to treat these cases, I lost fully seventy-five per cent of them, whereas, now I save seventy-five per cent, and I believe if the owner could see that the dog was sick at the start or in the incipient stage of the disease, and I could get to it in the first twenty-four hours, I could save ninety per cent of the cases; but as the veterinarian rarely gets to see the dog until the disease is well advanced, the prognosis may be considered unfavorable.

PREVENTION: Feed the dog in such a manner as to keep its vitality up to the highest pitch, and do not allow it to half starve, so that when it gets out it will eat every old putrefied carcass that it may run across, such as putrefied rabbits, chickens, sardines and salmon. The countrymen around here tell me their hounds always get black tongue when the road contractors camp is close to their premises, throwing out a great many salmon and sardine cans; but I don't think there is anything worse than putrefied chicken, some of the worst cases I have had have been from this cause.

My reason for believing this to be a dietetic disease and not infectious, is that we have five or six dogs of our own and always have from three to five cases of black tongue at the hospital, but have never had more than

one case of it in our own dogs. That was in a young St. Bernard, five months' old, and it was caused by eating putrefied chicken, thrown over the fence into our back lot by neighbors. However, as far as I am concerned, I am not interested so much in the proper name for this disease as I am in how to cure it. I am like the Germans. I used to treat their horses in Illinois, and usually the first thing the client would ask me was, "Doctor, can you cure him?" He didn't care whether it was pneumonia or typhoid fever. What he wanted was his patient restored to health.

TREATMENT: It would seem from the nature of the disease that the first thing would be a cathartic to unload the bowels of any effete material and stop further absorption of the same; but my experience with the disease has taught me to be careful in giving drastic cathartics. Besides it is hard to get the dog to hold anything on its stomach during the first twenty-four hours of the trouble. Therefore, I begin by giving hypodermically lobelin sulphate (Abbott's) in 1/60th to 1/40th grain tablets every four to six hours until three or four doses have been administered. This will put the stomach in shape to retain the following antiseptic and fever medicine:

℞ Specific tinct. Rhus toxicodendron.....M xv
Specific tinct. Echinacea .....ʒ iiii
Specific tinct. Glycerin .....ʒ iiii
Aqua dest. Q. S. .....ʒ iv

Mix. Sig. One teaspoonful every two hours until the soreness has disappeared from the mouth and the dog can begin to eat some. During this time, I feed from a spoon two raw eggs beaten up with a pint of sweet milk. I feed about four ounces at a time, repeating it three times a day. By the third day, the dog begins to eat without feeding him with the eggs and milk, when soft feed such as oatmeal porridge and boiled rice with milk or beef broth is given him. If the glands beneath the throat are swollen, I alternate phytolacca with the above prescription, and if there is a profuse flow of saliva indicating an acid condition of the blood, I substitute sodium sulphate in two to five grain doses every three to four hours, and about the second day after the attack, give medicinal doses of castor oil once every forty-eight hours. I then put the dog on the following tonic treatment:

Tinct. hydrastis .....m x
Spts. meuth. piper.
Tinct. echinacea .....aa ʒ i
Alcohol .....ʒ i
Aqua dist. q s.....ʒ iv

Mix. Sig. teaspoonful four or five times a day. This will act as a tonic and is a good appetizer.

By this line of treatment, I have reduced the mortality from seventy-five per cent to twenty-five per cent, and I believe if I could get these cases at the outside of the attack, I could reduce the fatalities to ten per cent.

In conclusion, will say that this disease called black tongue in dogs is in my opinion easily prevented by proper feeding, an occasional dose of physic and keeping the dog free from worms. We never fear black tongue any more, although our dogs are exposed nearly every day. If time and space would permit, I could cite many cases where I had myself given the dogs up to die, but by giving the medicine more often and pouring the milk and eggs back on their tongues, I have saved them.

La Grange, Ga. G. W. BROWNING, V. S.

MILK FEVER, DYSTOCIA AND EVERSION OF THE UTERUS SIMULTANEOUSLY.

The following case may be of interest to some readers of the Journal. On the day I was called to see this animal, the owner told me that she was trying to give birth to a calf and that he did not think that she was able to do so. I found a large Jersey cow, about five years old, in labor. The fore feet of the calf were out and the mother was lying on her side. On examination I found that the cow was suffering from a case of milk fever in addition to the dystocia and it seemed as if her time to die was but a few minutes away.

I removed the calf and when this was done the uterus came out also. This was replaced without much trouble and the vulva sutured after a pack had been placed in the vagina. Next the milk fever treatment was administered, atmospheric air being used. The next morning I was called and told that the womb had come out again. On going there, I found it was the afterbirth. This was removed and the lower satures were removed, permitting the pack placed in the vagina to come out also. I left the animal, with instructions for the owner to remove the other stitches as soon as there was no evidence of straining. The animal made a complete recovery.

There is one point brought out in this case, which I think will be of interest to some, and that is, would it not have been better to have administered the air treatment for the milk fever and then waited until it had some effect, thereby eliminating the possibility of a prolapse of the uterus on removing the calf? I believe now that I should have first treated the animal for the milk fever and then taken the calf. F. B. WHITFIELD, D. V. M.

Dothan, Ala.

COMMENT: Might not the dystocia have been overcome with the recovery from the paresis?

Dr. Carl A. Zell and Miss Leonie Weber, of Chicago, were married January 17th.

A CORRECTION

On page 35 of the January number in the report of the discussion regarding tuberculin testing, Dr. D. F. Luckey, State Veterinarian of Missouri, should have been credited with the discussion attributed to Dr. A. S. Cooley. The use of the eye test in the manner described is one of Dr. Luckey's pet ideas and is entirely original with him. He states that this method is particularly effective in picking our reactors, cattle that have been plugged and especially in getting at people who use drugs to counteract a rise of temperature.

WISCONSIN VETERINARIANS HOLD SUCCESSFUL CONVENTION

The second annual meeting of the amalgamated veterinary associations known as the Wisconsin Veterinary Medical Association, was held at the Park Hotel, Madison, January 16, 17 and 18, the dates and place of meeting being the same as those of the Wisconsin Women's Suffrage Association. As both associations have an extensive legislative program, lobbying was conspicuous, and the delegates to the latter association added not a little to the brilliance and the gayety of the crowd that packed the rotunda of the hotel throughout the meeting.

The veterinary association began its sessions Tuesday afternoon with the usual addresses of welcome, president's address, reports of committees and business meeting. The session on the evening of the first day was given over to the discussion of the tuberculosis question. No plan of procedure could be offered that was entirely satisfactory. The result was the appointment of a committee to draft a plan for state control of tuberculin testing in Wisconsin and for an arrangement for the certification of state accredited herds.

By the morning of the second day, nearly 150 members were in attendance. Nearby all the papers scheduled in the program were presented.

Dr. R. S. Heer of Platteville presented an interesting paper entitled, Twins vs. Freemartins, wherein he discussed briefly the theories that might explain the occurrence of freemartins. It was brought out that practitioners occasionally find freemartins while spaying heifers and that, in such instances, no ovaries are found.

Symptomatie Alopecia was discussed in a paper by Dr. F. W. Sutcliffe of Mt. Horeb. He cited a case, describing the appearance of the subject—a horse—and gave an interesting account of the course of the affection.

The discussion of Supplementary Dietary Relationship Among our Natural Food Stuffs by Professor E. V. McCullough of the University of Wisconsin. Professor McCullough stated that as long ago as 1911 he became convinced that there was no hope for the chemist to ever construct a successful ration for animals from pure proteids, carbohydrates and inorganic salts or even a ration that would keep them alive for any considerable length of time. It was discovered, however, that if to the ration of pure proteids, carbohydrates and inorganic salts a small quantity, even so small as three per cent of wheat germ or five per cent of butter fat or for that matter of any animal fat was added, the ration became a successful one. In other words, a ration balanced so far as the best chemist in the world could tell, was still a total failure unless it had certain substances from nature added, the effect of which upon the food was unknown. Professor McCullough designated these substances as "fat soluble A" and "water soluble B" and has conducted many hundreds of experiments that prove the correctness of this conclusion. Rats were used in most of these experiments. It was shown that rats fed on wheat grain alone always died in seventy days or less, and they made no growth. A complex feed consisting of five seeds gave little better results. His experiment demonstrated that the leaf from the alfalfa plant was the best of adjuvants to use with grain feed and that almost any grain or combination of grains combined with 30 per cent alfalfa leaves constituted a ration on which animals would thrive.

Dr. Karl W. Smith addressed in an interesting manner the subject of communicable skin diseases from animals to man. Dr. Smith stated that he believed it would prove of interest to discuss only the commoner of diseases which may be transmitted from animals to man, and among such he mentioned scarlet fever and measles, which are frequently carried in some way by cats and dogs, farcy of the skin, a form of anthrax which is often acquired from horses, actinomycosis acquired from cattle and occasionally from other animals, and anthrax which is not infrequently acquired from animal skins, although seldom from the living animals. He also mentioned among these, gadfly disease and cow pox. He said that favus may be acquired from cats, bird mite disease from birds, and lesions simulating those of urticaria but due to fleas, from dogs. It was stated that the

common term "ringworm" includes a number of different affections which may be acquired from animals or otherwise. He has observed that impetigo contagiosa of adults is common only among those closely associated with cattle. The manner in which this infection is acquired from cattle, if it is so acquired, is not known. An application consisting of equal parts of tincture of iodin, chloral hydrate and phenol, was advocated for the treatment of the latter infection. Several other preparations were likewise recommended as being efficacious.

As might be expected in a state where dairying has attained the importance that it has in Wisconsin, the paper of Dr. W. L. Boyd from the University Farm of Minnesota on the Pathology of Contagious Abortion, was received with great attention. Dr. Boyd's lecture was illustrated with considerable number of lantern slides showing lesions produced by the contagious abortion disease and secondary infection, obtained in an extensive investigation of this trouble in Minnesota. The speaker pointed out that a knowledge of the pathology of contagious abortion was of very great importance, if for nothing else, for making an inventory of the dairy; it being of much value economically for a breeder to know which of his animals had been rendered permanently sterile by contagious abortion and what part of the nonbreeders in the herd offered hopes of recovery from treatment. Dr. Boyd stated that granular vaginitis was now generally considered to be due to abortion disease rather than another affection, but some believe it results from coccus. While it was not positively known that it was one of the symptoms of abortion, the two were so often associated that there appeared good reasons for considering it as such. Aside from this, the speaker mentioned abortion, premature birth, retained placenta, cystic ovaries and pyometra as the cardinal symptoms of contagious abortion. He stated it as his opinion that white scours in calves and calf pneumonia were due chiefly to infection by the colon bacillus acquired by the fetus through swallowing of amniotic fluid. He said that white scours and calf pneumonia appeared to bear a close relationship to contagious abortion, or at least are found in conjunction with it, but he was unprepared to state that these conditions were due directly or even indirectly to the abortion bacillus or that it was a positive symptom of contagious abortion.

Dr. Boyd laid great stress upon the importance of veterinarians familiarizing themselves with the manipulation necessary in the examination of a herd in which contagious abortion occurs or the disease is suspected of being present. He stated that the uterus, ovaries and oviducts were very readily palpated per rectum; that the normal nonpregnant uterus could be gathered into the hand or covered with the palm of the hand upon the floor of the pelvis; that the normal ovaries were an inch and a half long and a half to three-quarters of an inch in diameter; and that the healthy oviduct could not be felt through the rectum. He stated that in endometritis, the enlarged uterus and boggy walls could readily be detected by rectal examination and that there was no difficulty in detecting cystic or sclerotic ovaries; and that an oviduct that was dropsical or filled with pus or in any manner inflamed or enlarged could be detected through the rectum. He stated that manipulation of the ovaries for the extirpation of retained false, yellow bodies was an absolute prerequisite for the best results in the treatment of pyometra, claiming that as has been proved, in all cases of pyometra one ovary contains a degenerated yellow body usually sunk deeply into the ovary and covered by epithelium. It was explained that there was considerable difficulty in squeezing out some of these yellow bodies and that it should not be attempted through the rectum, but by means of the hand in the rectum the ovary should be passed back to the hand in the vagina and the operation performed through the wall of the latter organ.

The lantern slides showed that contagious abortion disease is characterized by a great tendency to the formation of cysts. In the lesions shown, there were cysts in the ovaries, dropsical oviducts and numerous cysts in the walls of the uterus.

Canine Distemper by Dr. N. S. Ferry of Parke, Davis & Co., was a paper replete with information both as to the history and the pathogenicity of this disease. Dr. Ferry stated that this is the oldest known disease of dogs, but that in early times it was confused with rabies. In fact, it was not until 1809 that the differentiation was made by Edward Jenner, famous as the discoverer of small pox vaccine and the originator of vaccination as a means of preventing disease. The essayist pointed out that while canine distemper is not ordinarily regarded as an economic problem in this country, there are places where it is of the greatest economic importance, particularly Siberia, Greenland and Iceland.

Although some have doubted and still doubt that the Bacillus bronchisepticus isolated by Dr. Ferry in 1910 is the etiologic factor in this disease, Dr. Ferry feels that his claims in this matter have been amply corroborated by the work of other investigators in all parts of the world. He states that the same organism affects cats, rabbits, guinea pigs, monkeys, and rarely humans, and that bacterins made from this organism are a valuable prophylactic agent, but that neither serums nor bacterins possess any considerable curative properties. He states that the symptoms and lesions of distemper in dogs are practically all due to secondary infection and that the disease produced by the bronchisepticus and uncomplicated by other pathogenic organisms is a mild, almost trivial, infection, but that its danger and importance lies in its ability to render the animal susceptible, to pave the way, as it were, for the secondary infection.

In the discussion of this paper, the essayist was asked the following questions:

(1) Does the bacillus bronchisepticus occur normally in dogs? Is it found in the bronchial tubes of healthy animals in which there is no history of their having had an attack of distemper?

(2) If the same organism causes the disease in dogs and cats, why is it so rare in the latter animal, and why does it not spread from sick dogs to cats in veterinary hospitals where no attempt is made to prevent such extension of the disease, it being granted that distemper spreads rapidly among cats once they are infected, showing that their susceptibility is great and the mortality is known to be high?

(3) Rabbits, in the speaker's experience, suffer in the main only from snuffles and from intestinal parasites. Is the suffles due to Bacillus bronchisepticus?

(4) If bronchisepticus bacterin has such splendid prophylactic properties, and it is admitted that it does have them when used experimentally in the laboratory, why is there such a lack of unanimity of opinion on this matter among practitioners? Why are there so many able and experienced canine practitioners who have little or no faith in the bacterin as a prophylactic?

Dr. Ferry's replies to the questions were in substance as follows:

(1) Just as there are carriers among humans of diphtheria, so there are carriers of distemper among dogs. The fact that there is no history of a dog having an attack of distemper, is not sufficient ground for assuming that the dog has not had the disease, as it may have been so mild in form that it was entirely overlooked by the caretaker. Bacillus bronchisepticus is found in the bronchi of many healthy dogs, but not in all of them.

(2) It is the belief of the essayist that cats are not nearly so susceptible to distemper as dogs. He stated that it was rare for distemper to be communicated from a dog to a cat, even under the closest associations.

(3) He believed that there is an anatomical peculiarity in rabbits which causes practically every ailment to manifest the symptoms of snuffles. He believed there were many ailments of rabbits that go under the common term of snuffles, but perhaps the commonest and the most fatal is due to the Bacillus bronchisepticus.

(4) The Bacillus bronchisepticus is so universally distributed that it is difficult to control the exposure. An animal receiving a bacterin of this organism has its resistance at first lowered and its liability to acquire distemper from mild exposure increased, and it surely ought to be protected from intense infection for at least four weeks. Furthermore, the prophylactic treatment should probably be repeated at intervals of a year until the animal has had three or four treatments. He believes that the failure to observe these principles is responsible for the failure of bacterins in the hands of capable practitioners.

First.—The puppy must receive its prophylactic treatment early.

Second.—It must be kept from exposure for three or four weeks.

Third.—The treatment must be repeated as the immunity wears off until the animal is somewhat aged and we may conclude that immunity has become permanent.

"The Fox Industry," by Dr. J. S. Collins, was an unusual and novel discussion. Dr. Collins is the promoter of a company for the breeding of foxes in Wisconsin and is very full of statistics and enthusiasm for this business. Dr. Collins stated that the industry of breeding foxes was originated only twenty-six years ago by a trapper named Charles Dalton, who lived on Prince Edward Island. In the year preceding that, Dalton captured a pair of silver foxes. The following year they produced five whelps, which Dalton killed, together with the old ones, and whose pelts he sold for $2,800. As Dalton was a poor trapper who barely eked out an existence prior to that time, he realized after this that he had made some money and also that he had "killed the goose that laid the golden egg."

So in company with another inhabitant of Prince Edward Island the following year, he captured a pair of black foxes. Both partners being canny Scots, they decided to keep the matter a secret, and they did until 1909. In this season they sold fifty pelts at an av-

erage price of $1,300 apiece. Their fox breeding industry was the joke of the village. In 1909 some disagreements arose between the partners and the partnership was dissolved. They had a gentleman's agreement never to sell any breeding foxes, but when a nephew of Dalton's, a bookkeeper, was called in to adjust their financial matters, he discovered that both men were wealthy and that there was a great deal of money in breeding foxes. The result was he purchased from his uncle a pair of foxes for $1,000. This displeased Dalton's partner and he sold some breeding foxes, and the industry was established. The prices of breeding foxes mounted rapidly until in 1914 a single pair was sold for $35,000, and in the same year options on unborn pups reached the fabulous price of $16,000 a pair, and there were 200 ranches on Prince Edward Island engaged exclusively in the business of breeding foxes. The outbreak of the war in 1914 gave the business a great setback, and in 1915 options on the pups had declined to $1,000 a pair. Since that time it has risen, and Dr. Collins predicts that the next five years will see more money invested in the fox breeding industry in the state of Wisconsin than in the breeding of any other animals. His success during the recess at the meeting in inducing veterinarians to buy stock in the company at $10.00 a share was such as to indicate that there will be a great deal of money invested in the fox breeding industry if Dr. Collins gets access to the possessors of said money.

Dr. G. A. Johnson, of Sioux City, Iowa, gave the association an interesting discussion of the matter of the immunization of farm animals. He stated that almost all of our knowledge regarding immunity to disease is clinical or empirical and that the laboratory is able to tell us little about this matter. He developed the fact that immunization in the past had not been considered as a professional problem and had been dealt with by veterinarians in a manner to encourage the laity to undertake this work. He pleaded with those present to regard the immunization of animals as a professional problem and hasten the day when the use of immunizing agents would be confined to the hands of veterinarians.

In proof of his statement, he cited the following illustration. If a veterinarian is called to treat a case of colic, his first procedure is to examine the animal carefully and to determine upon the treatment he will use and proceed to use it. If he is called to immunize some hogs, he asks the owner over the wire how many there are and how much they weigh, instructs the owner to get his hogs up in a small pen, and tells him he will be out the next morning. He takes the amount of serum stated on the labels of the bottle as being necessary for this number of hogs of this weight, proceeds to the farm, instructs the owner to catch the hogs, and gives them the serum. He does not investigate the feeding and hygienic surroundings of the hogs to determine what their resistance may be. Rarely does he investigate to find if any other disease besides cholera is present. Dr. Johnson pointed out that the dosage given on the labels of serum bottles is intended for healthy hogs of normal resistance and stated that where serum is used indiscriminately on hogs of all classes, those with lowered resistance due to disease or unhygienic surroundings or other causes, are bound to suffer to a greater or less degree from vaccination for cholera.

He further stated that a very frequent cause of disastrous results following vaccination is underestimation of the weight of pigs. He made an urgent plea for large doses of serum and stated that the owner's objection to the expense entailed could easily be overcome by a little diplomacy, citing the following instance of his own. He was called to vaccinate some shoats and estimated them to weigh seventy-five pounds each. The owner was doing the holding and objected, stating that he did not believe that the hogs weighed more than sixty pounds. Dr. Johnson then required him to hold the pigs clear off the ground. When the owner had caught one or two more, he said he believed that they did weight seventy-five pounds, and before the vaccination was over, the owner assured Dr. Johnson he believed the pigs weighed at least one hundred pounds and some of them a hundred and twenty-five pounds.

A most valuable paper was one by Dr. Ed. Merillat, of Chicago, on "Anatomy of the Parts Concerned in the Operation for Roaring." Dr. Merillat's lecture was illustrated by lantern slides and thoroughly enjoyed by all present. It was discussed at length by Dr. Joseph Hughes, of Chicago, Dr. T. H. Ferguson, of Lake Geneva, and Dr. J. V. Lacroix.

Dr. Hughes stated that it was his belief that almost all cases of roaring are due to influenza, that is, to an involvement of the recurrent laryngeal nerve in the inflammation of the anterior pleura, and he deplored the fact that Illinois and Wisconsin and many other states barred such animals from registration under the stallion laws. He cautioned operators to beware of injuring cartilage in any part of the body, particularly in the larynx, and stated that in the insertion of the trachea tube the cartilaginous ring should never be injured, that there is ample room for the insertion of a tube one and one-half inches in diameter between the rings, and that it was nothing short of malpractice for a veterinarian to injure the cartilaginous ring in inserting the trachea tube.

The legislative committee presented a report asking for a change in the veterinary practice act of Wisconsin to permit students to practice under preceptors for not more than eighteen months and to repeal that section of the law that provides that a veterinary license is not necessary for castrating spaying, dehorning, treatment of fistula, spavin, strains and minor injuries, and tuberculin testing or any veterinary practice conducted more than ten miles from the office of the nearest licensed veterinarian. The effect of the amendment will be to place all of this work in the hands of licensed veterinarians.

Professor F. J. Cole, of the Department of Experimental Breeding of the University of Wisconsin, gave an instructive lecture on teratology, illustrating his talk with lantern slides. He is making investigations regarding twins and their characteristics, including colors and markings.

The discussion dealt quite largely with the phenomenon of twins in cattle and particularly with the freemartin. Professor Cole pointed out that twins are of two types, classed as true twins, individuals developed simultaneously in the uterus from separate ova, and identical twins, two festuses which are in reality the same individual produced by the division of a single ova. He stated that ordinary twins do not and should not resemble one another any more than the progeny of the same parents at different periods of gestation. Identical twins ordinarily possess identical markings and identical inherent characteristics. He stated that all double monsters are identical twins, in which the division is incomplete, or to turn it about, that identical twins are double monsters in which the division is complete.

He expressed it as his opinion based upon considerable investigation that the so-called freemartin heifer is in reality an undeveloped male, one of a set of identical male twins, and stated that this phenomenon, that is, the failure of the development of the male characteristics in one of the identical male twins, so far as known, occurs only in the bovine species.

Professor Cole is collecting a large amount of data regarding twin calves and is exceedingly anxious to obtain all photographs possible of double monsters. Readers are asked to obtain photographs of these wherever possible and send to this office or direct to Professor Cole, care of the University of Wisconsin, Madison, Wis. He would also like to have readers send in the generative organs of such calves. If the external genitals are normal, send only the ovaries and testes. If any abnormality appears in the external genitals, they should be sent also.

Dr. N. S. Mayo, Chicago, presented a paper on the "Business Side of Veterinary Practice." He urged that veterinarians adopt more of the methods that successful business men found necessary in conducting a business. He urged his hearers to render good service, and to charge and collect a fair price. He characterized the mailing of monthly statements to all debtors as absolutely essential and said that veterinarians must not neglect to keep up their own credit by the prompt payment of all their obligations.

The clinic was in charge of Dr. T. H. Ferguson, of Lake Geneva, and proved interesting to a large number of the veterinarians who were in attendance most of the day. More cases were available than there was time to handle; consequently, a number of unusually interesting cases were chosen from the number.

Four cases of laryngeal hemiplegia, three of fistulous withers, one of poll evil, one of side bone, one of costal fracture, one of suppurative alveolar periostitis and several cases of lameness, constituted the principle equine subjects. Canine subjects were also presented. A demonstration of the technic of manipulation of the genitalia of cows for the diagnosis and treatment of sterility was given by Dr. Ferguson. This, of course, attracted much attention and the subject was presented in an interesting manner. Other operators were Drs. L. G. Hart, L. A. Wright and J. V. Lacroix.

STATE VETERINARY EXAMINING BOARDS AND EXAMINATIONS

Many inquiries are received at this office for information as to the requirements for veterinary practice in various states and as to the dates of examination, names and addresses of members of the examining boards, scope and kind of examination, etc.

In many states the requirements for registration for practice is left to the discretion of the board; that is, the board may require an examination, or it may register graduates from accredited schools without examination. Under such circumstances, the requirements are quite apt to change with a change in the board, and for definite information on this subject at any given time, it is best to write some member of the board direct. We give below a list of the present officials of the boards to address for this information.

This list is complete according to our latest information. It should be borne in mind that many state administrations have changed during the past thirty days and that this will result in numerous changes in veterinary examining boards, appointment to positions on these boards being made in most cases by the governors of the various

states. It will be well to enclose a stamp for reply in writing for information for use in case the individual addressed is no longer a member of the board, and postage for official correspondence is no longer available.

Alabama—C. A. Cary, Auburn, secretary.
Arizona—No board.
Arkansas—R. M. Gow, Fayetteville, president.
California—O. A. Longley, 224th and Broadway, Oakland, secretary.
Colorado—W. W. Yard, Denver, secretary.
Connecticut—H. E. Bates, Norwalk, secretary.
Delaware—F. P. Ruhl, Milford, secretary.
District of Columbia—J. R. Mohler, Washington, president.
Florida—No board.
Georgia—P. F. Bahnsen, Americus, secretary.
Idaho—R. B. Hurd, Payette, treasurer.
Illinois—C. A. Lowrey, Springfield, secretary, ex-officio.
Indiana—H. J. Kannal, Rensselaer, secretary.
Iowa—J. I. Gibson, Des Moines, president.
Kansas—O. O. Wolf, Ottawa, secretary.
Kentucky—Robt. Graham, Lexington.
Louisiana—J. A. Goodwin, New Iberia, president.
Maine—W. H. Lynch, Portland, secretary.
Maryland—A. K. Heagerty, Baltimore, secretary.
Massachusetts—E. W. Babson, Gloucester, secretary.
Michigan—C. C. Mix, Battle Creek, president.
Minnesota—L. Hay, Faribault, secretary-treasurer.
Mississippi—E. M. Ranck, Agricultural College, vice-president.
Missouri—D. F. Luckey, Columbia, secretary.
Montana—A. D. Knowles, Missoula, secretary.
Nebraska—J. S. Anderson, Lincoln, president.
Nevada—No board.
New Hampshire—Guy E. Chesley, Rochester, president.
New Jersey—W. A. Fitzpatrick, Burlington, president.
New Mexico—No board.
New York—H. L. Beebe, Albion, secretary.
North Carolina—G. A. Roberts, W. Raleigh, secretary.
North Dakota—C. H. Babcock, New Rockford, secretary.
Ohio—Rubin Hilty, Toledo, president.
Oklahoma—Edward Pugh, Lawton, secretary.
Oregon—W. H. Lytle, Salem, president.
Pennsylvania—J. W. Sallade, Auburn, secretary.
Rhode Island—J. S. Pollard, Providence, secretary.
South Carolina—No board.
South Dakota—Frank R. Cock, Bellefourche, secretary.
Tennessee—M. Jacob, Knoxville, secretary.
Texas—E. F. Jarrel, Dallas, president.
Utah—John Ernst, Salt Lake City, secretary.
Vermont—Geo. Stephens, White River Junction, secretary.
Virginia—H. Bannister, Roanoke, secretary.
Washington—W. D. Garratt, Puyallup, secretary.
West Virginia—W. E. Langford, Martinsburg, secretary.
Wisconsin—T. H. Ferguson, Lake Geneva, secretary.
Wyoming—A. W. French, state veterinarian, Cheyenne.

Of course, we are not able here to give information as to what the examinations of any state will consist of. The following list of questions have been used in recent state examinations and may be taken as somewhat typical of the more difficult examinations given by state veterinary examining boards.

Very recently the examinations have come to deal more and more with questions pertaining to animals other than the horse and with questions of sanitation, quarantine, the handling of contagious diseases, etc. The veterinarian who is to make a success in practice in most agricutural communities henceforth must be a man as well versed in diseases of cattle, sheep, hogs and dogs, as he is in diseases of the horse. He must also understand the broad principles of disease prevention and disease control. Examining boards, realizing this, are more and more coming to ask questions to determine if the applicant possesses these qualifications.

Examination in Comparative Anatomy.

1. Describe the humerus of the horse.
2. Describe the fetlock joint of the horse and name all structures covering it.
3. Name the divisions of the alimentary canal of the horse, pig, ox, and give the differential characteristics of ox and pig from that of the horse.
4. Describe the small mesenteric artery in the horse and name its distributing branches.
5. Describe the deep flexor of the phalanges in the horse; give its origin, inser-

tion, blood and nerve supply, accessory structures and function.

6. Describe the foramen ovale; trace the umbilical vein in horse.

7. Give location, course and termination of the thoracic duct in horse.

8. Give arrangement, divisions, number in each division, mode of origin and characteristics of the spinal nerves.

9. Give the location of the cornea, choroid, ciliary body, iris and crystalline lens.

10. Describe the sensitive lamine in the horse and give its function.

11. Describe the structures in their order through which a nail would pass in penetrating the center of the frog of a horse's foot perpendicularly.

12. Give ages at which the permanent teeth of the horse erupt.

13. Name and give the relative position of the various openings communicating with the pharynx.

14. Describe the distribution and function of the fifth cranial nerve.

15. Describe the relation of the peritoneum to the testicle.

Theory and Practice.

1. Influenza: characterization; synonyms; occurrence; etiology; pathogenesis; symptoms; complications; course; differential diagnosis; treatment.

2. Pleuritis: occurrence; etiology; anatomical changes; symptoms; course; treatment.

3. Hemorrhagic septicemia: occurrence; etiology; anatomical changes; symptoms; differential diagnosis.

4. Pyo-septicemia of sucklings: synonyms; characterization; occurrence; etiology; pathogenesis; anatomical changes; symptoms; treatment.

5. Hog cholera: characterization; occurrence; etiology; pathogenesis. Name four forms the disease may assume. Diagnosis; treatment.

6. Tetanus: characterization; etiology; mode of infection; symptoms; treatment.

7. Tuberculosis: characterization; etiology. Through what system is the disease distributed? Give detailed outline for making tuberculin test.

8. Give symtoms of insufficiency of mitral and tri-cuspid valves of heart.

9. Acute pharyngitis: characterization; occurrence; etiology; anatomical changes; symptoms; prognosis; treatment.

10. Give symptoms, course and treatment of intestinal strongylosis of horses.

11. Give the action of digitalis. In what disease is it indicated? Give dose for horse, cow and dog.

12. Write a prescription for a general tonic.

13 In what disease is chloral indicated? Name an antidote in case of an over dose of chloral.

14. Write a prescription for a case of chorea following distemper in dogs.

15. Prescribe treatment for a case of garget in a cow.

Pathology.

1. Define the following terms: hemorrhage: petechiae; ecchymosis; aneurism; embolus.

2. Describe the lesions associated with hog cholera.

3. Give a method (other than post-mortem changes) for diagnosing a case of anthrax.

4. Describe the lesions accompanying symptomatic anthrax (black leg), and tell how it differs from malignant edema.

5. What lesions are to be found in a case of glanders?

6. How prepare a specimen of diseased tissue to be sent to a laboratory for a bacteriological examination?

7. Give a rapid method for diagnosing rabies in the brain of a rabid animal.

8. Give the Strauss method for diagnosing glanders.

9. Give Kruse's classification of the pathogenic bacteria.

10. Give the biochemic properties of the colon group of organisms.

11. Name a pathogenic organism causing disease by eliminating a toxin and describe the action of an antitoxin.

12. Name four common parasitic diseases of sheep.

13. Give the life cycle of the Taenea coeneurus.

14. Name two species of worms common to the alimentary tract of horses. Give the life cycle of Ascaris megalocephalus.

Surgery.

1. Describe the operation of amputation of the penis and name structures cut through.

2. Give in detail how you would treat a wound five or six hours old.

3. Explain in detail how a wound heals and indicate the most important factors in treating a wound.

4. Describe in detail how you would proceed in trephining to remove an upper sixth molar of a horse where extraction through the mouth was impossible.

5. Describe fully castration of horses, giving names of anatomical structures cut through. Would you leave large or small opening?

6. Describe fully the manner of reduction of a simple fracture occurring in leg of horse.

7. Give in detail etiology, diagnosis, prognosis and treatment of chronic navicular disease.
8. Give the operation and technic of reduction in inguinal hernia.
9. How would you treat a case of suppurating corns in a horse?
10. Describe operation of tenotomy to relieve spavin lameness in a horse.
11. Name some important factors in treating fistulous tracts.
12. Describe the operation to relieve tympanites in horse and cow.
13. State fully how to treat suppurating nail puncture in foot of horse.
14. Describe the operation of paracentesis thoracis, and what precaution should be used.
15. Describe operating on chryptorchids.

Obstetrics.

1. What disease conditions may follow retention of fetal membranes in a mare?
2. Give period of gestation in a mare, cow, bitch, ewe and sow.
3. Define dystocia: presentation; premature birth; abortion and estrum.
4. Explain how to treat breach presentation in mare, hind legs retained.
5. Describe fully operation of reducing prolapsed uterus in cow.
6. Name different causes of abortion and give treatment.
7. How long would you leave retained placenta in mare or cow without taking immediate steps for removal?
8. What is meconium and colostrum?
9. Give symptoms, cause and treatment for nymphomania in mare.
10. Give cause, symptoms and treatment for parturient apoplexy in cow.
11. Give cause, symptoms and treatment for mammitis.
12. Give cause, symptoms and treatment for perforate urachus in foal.
13. Give symptoms and treatment for retention of meconium in a foal.
14. What is hydrocephalus, how diagnosed and handled in the unborn?
15. Describe dystocia resulting from ascites or hydrothorax and treatment.

Clinical Diagnosis.

1. What is diagnosis?
2. Write five questions that would be suitable to ask the owner in arriving at a diagnosis.
3. What do you consider the two most important conditions to be considered in arriving at a diagnosis, excluding the history of the case?
4. Is there any difference in the hemorrhage from an artery and that from a vein? If so, how could you differentiate?
5. Give the symptoms of excessive hemorrhage.
6. (a) For what is the tuberculin test used? (b) How is it made and how will it help in arriving at a diagnosis?
7. (a) What is the mallein test? (b) How is it made, and how will it help in arriving at a diagnosis?
8. Define fever and name five diseases in which it is an attending symptom.
9 and 10. Give symptoms of influenza and some of the sequellae which are apt to follow.

Physiology.

1. Give the physiological action of the heart.
2. Explain the process of digestion in stomach of ruminants.
3. What two nervous systems are there, and where are they located?
4. Give the names and action of secretions in alimentary canal.
5. What is meant by blood pressure? Where is it highest and where lowest?
6. Animal heat; how produced; how distributed and how lost?
7. Give the pulse, respiration and temperature of the horse, ox, dog, sheep and pig.
8. Describe the difference between blood serum, plasma, lymph and give the use of fibrin.
9. Name the pancreatic secretions and give the functions of each.
10. Describe the physiological functions of the gall bladder in the horse.
11. Name the divisions of the mucus membrane in the stomach of the horse and the glands found in each portion.
12. Name the important component parts of urine.
13. Name some abnormal constituents of the urine.
14. Describe the physiology of respiration.
15. Describe briefly some important tests for urine.

Chemistry.

1. Define chemistry, analysis, synthesis, molecule, atom.
2. Give the symbol and atomic weight of the following elements: antimony; calcium; iron; phosphorous; sulphur.
3. Describe the meaning of the terms: water of crystallization; diliquescence; efflorescence.
4. Describe the manufacture of hydrogen from granulated zinc, writing the formula of the reaction thus: Zn. + ? = ?
5. Complete the following equations:

$CaCO_3 + 2HCl =$

$2NaCl + H_2SO_4 =$

$Cu. + 2H_2SO_4 =$
$NH_3 + CO_2 + NaCl + H_2O =$

6. Define Avogadros law in relation to volumes of gases.

7. Describe the Marsh test for arsenic.

8. Give the metric system equivalents of the following apothecaries weights and measures:

1 grain	1 fluid ounce
1 dram	1 pint
1 ounce.	

9. If a Fahrenheit thermometer reads 98.6°, what is its equivalent in centigrade degrees?

10. Give the normal specific gravity of horse urine, ox urine. If a given quantity of urine shows a specific gravity of 1018, how estimate the total solids of Trapp's factor, by Bird's formula?

11. Describe a test for albumin in the urine, a test for sugar.

12. Describe Heller's test for the presence of hemoglobin in the urine.

13. Describe the Babcock test for the percentage of butter fat in milk.

14. Give the requirements of this state as to percentage of fat and solids not fat in milk.

15. Describe a test for the presence of formaldehyde in milk.

THE NEBRASKA MEETING ECLIPSES TWENTY PREDECESSORS

Nebraska just finished one of the best veterinary meeting, held December 19, 20 and 21, in the entire life of the association. The attendance was far ahead of that of any meeting in the 20 years the association has existed, and the interest was shown by the attendance from the opening on the first day of the meeting right up to adjournment on the last day. Having extremely cold weather at the time of the meeting was quite an inducement for the practitioner to absent himself from his office and miss the long drives which usually come on such occasions.

Our meeting heretofore has been a two-day one, but owing to the number of subjects which seemed imperative to consider, we had to extend it to a three-day meeting in order to cover the subjects properly and give every one a chance to take part in the discussions, and apparently everybody took advantage of the opportunity.

The committees with few exceptions handled their part of the program nicely, which relieved the secretary of much work in preparing the program.

The entire program was disposed of in a manner that seemed to please everybody. One thing especially was adhered to closely, and that was rendering the subjects on the program at the hour scheduled, which is a difficult matter in most associations.

Dr. F. F. Brown of Kansas City gave us a very interesting lecture on "Sterility in Mares," calling attention to many predisposing factors which heretofore have been overlooked, and from the discussion that followed everybody must have gained some knowledge along this line . We all enjoyed having Dr. Brown with us for we feel he belongs here in Nebraska, having been born at Syracuse.

Dr. R. C. Moore of St. Joseph was more than welcome with his paper on "Mammitis in Cows," which is a never ending trouble to the practitioner, and as Nebraska is coming to the front as a dairy state, we felt keenly the necessity for just such information as Dr. Moore gave to us.

Dr. A. T. Kinsley held the entire association at bay, including stock men and dairy men of the state, pausing occasionally to "let that soak in," while he poured oil on the troubled waters regarding hemorrhagic septicaemia and cornstalk disease and dealt out facts about contagious abortion in great "gobs" that were enough to choke an ordinary veterinarian, but we must have grasped a few ideas from the discussion that followed and presented a few from the questions asked. Anyhow, Dr. Kinsley diagnosed our trouble correctly and prescribed equally as well, for it gave results.

Dr. D. F. Luckey of Columbia, Mo., no doubt came nearer piercing a vital spot in us all when he took up the subject of tuberculosis in his illustrated lecture Wednesday evening. The audience consisted of veterinarians, stock men, dairy men, sanitarians, agricultural newspaper men, university professors and city health offiicals, and beyond the question of a doubt he had us all convinced of the necessity of a universal campaign against tuberculosis. If you ever get a chance to hear Dr. Luckey, go, for it will do you good. We need more Dr. Luckeys.

Dr. H. Jensen of Kansas City had charge of the round table on general practice and has always proven interesting and instructive, and at our meeting everyone just seemed to "loosen up" and pour out his troubles as if he was the only one in Dr. Jensen's presence, so, of course, you may know the good results which follow. Dr. Jensen always has something in store to suit the occasion, which makes things all the more interesting.

Dr. C. A. McKim gave an excellent report of the committee of diseases, reviewing all outbreaks occurring in the state in the past year, which was instructive to us all. Dr. Nichols gave a very interesting report of the committee on therapeutics, calling attention especially to substitutes for drugs that have advanced so in price as to render their use prohibitive. Committee work like the reports of the last two named is what counts. Dr. Anderson rehearsed the work done by the legislative committee which we all appreciate. Drs. Anderson and McKim gave a very instructive talk on methods of conducting and reporting interstate and private tests for tuberculosis and glanders.

Twenty-eight candidates were elected to membership, an indication of the growth of our association.

Dr. G. J. Collins of West Point was elected president and Dr. Young of Syracuse, vice-president, and Dr. S. W. Alford of Lincoln, secretary and treasurer.

Our next meeting will be either the week before or the week following the meeting of the National Live Stock Sanitary Association in Chicago, which is held the first week in December.

Lincoln, Neb. S. W. ALFORD,
Secretary.

The Montana Veterinary Medical Association met at Missoula, Mont., January 5th and 6th. A unique feature of the meeting was that the public were invited to attend, and in addition to the members, a number of physicians, laymen and the representatives of several women's clubs were on the program. One whole afternoon was devoted to meat and milk inspection questions.

Report of Committee on Uniform Live Stock Regulations, United States Live Stock Sanitary Association, for the Year 1913

. The following report of the Committee on Uniform Live Stock Regulations of the U. S. Live Stock Sanitary Association was printed and distributed among the members:

Your Committee for the year 1913 on Uniform State Regulations Governing the Movement of Live Stock, prepared a report which was agreed on by a majority of the members. It was not submitted to the Association either at the 1914 or 1915 meeting.

The report drafted in 1914 was transmitted to the Chief, Bureau of Animal Industry, November 2, 1916, for his criticism. After making several changes in the report, it was returned and we have the honor to submit it now as a delayed report.

It was predicated upon the Acts of Congress approved May 29, 1884, February 2, 1903, March 3, 1905, and June 29, 1906, which govern the interstate movement of live stock.

Section 6, of the Act of Congress approved May 29, 1884, provides, That no railroad company within the United States, or the owners or masters of any steam or sailing vessel or boat, shall receive for transportation or transport, from one state or territory to another, or from any state into the District of Columbia, or from the District of Columbia into any state, any live stock affected with any contagious, infectious or communicable disease; nor shall any person, company or corporation deliver for such transportation to any railroad company, or corporation, or master or owner of any boat or vessel, any live stock, knowing them to be affected with any contagious, infectious or communicable disease; nor shall any person, company, or corporation, drive on foot or transfer in private conveyance from one state or territory to another, or from any state into the District of Columbia, or from the District of Columbia into any state, any live stock, knowing them to be affected with any contagious, infectious or communicable disease.

Section 3, B. A. I. Order 245.

Provides That, Before offering cattle or other live stock for interstate transportation, transporting them interstate or introducing them into any stock yards or upon routes of traffic for interstate transportation, all persons or corporations are required to exercise reasonable diligence to ascertain that such animals are not affected with any contagious, infectious or communicable disease, and have not been exposed to the contagion or infection of disease by contact with other animals so diseased or by location in pens, cars or other vehicles or upon premises that have contained diseased animals.

The shipment of a tuberculous cow or hog; a glandered horse, mule or ass; a scabby sheep, horse, mule or ass; a ticky cow, horse, mule or ass or any other equine, bovine or ovine affected with or exposed to a communicable disease from Texas into Rhode Island or from Florida into Idaho or vice versa is a violation of the United States law and regulations of the Secretary of Agriculture, punishable, on conviction, by a fine, imprisonment, or both, providing it can be proven that the shipper knew that the animals shipped

were diseased at the time of their delivery to the transportation company.

The adoption of Federal regulations by the various states may, at times, be found to be of material aid as they proved to be in North Carolina as set forth by the learned Supreme Court in the case,

State vs. Southern Railway Company, Southeastern Reporter, Volume 54, page 294:

"When such a regulation by the Federal government operates and takes effect in the State of North Carolina, it is in no sense a foreign law. The laws of an American state are never considered as foreign in the Federal courts and vice versa, those which find their origin in the Federal branch of the government are treated as domestic laws in the tribunals of the different states."

Proposed Uniform State Regulations Governing the Movement of Live Stock

Regulation 1

Section 1. The regulations and amendments thereof of the United States Department of Agriculture, concerning the interstate transportation of live stock are hereby adopted as a portion of the regulations of this Board during such time as said regulations are in force, in so far as said regulations conform with the Live Stock Sanitary Laws of .....; and the regulations of the Live Stock Sanitary Board of .....

Section 2. Whenever in these regulations or in the rules based thereon, the word interstate is used, it shall be construed to mean between another state or the District of Columbia and this state. Whenever in these regulations or the rules based thereon, the word intrastate is used it shall be construed to mean within this state.

Section 3. Before offering cattle or other live stock for intrastate transportation, or transporting them, or introducing them into any public stock yards, or upon routes of traffic for intrastate transportation, all persons or corporations are required to exercise reasonable diligence to ascertain that such animals are not affected with any communicable disease, and have not been exposed to the contagion or infection of diseases by contact with other animals so diseased, or by location in or upon pens, premises, cars or other vehicles that have contained diseased animals.

Section 4. Disinfection of premises, cars, boats, etc.

Paragraph 1. Except as hereinafter provided for in these regulations, premises, cars, boats, and other vehicles that have contained diseased cattle or other live

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stock, shall not be used in the transportation of healthy animals within this state until the said premises, cars, boats, and other vehicles shall have been thoroughly cleaned of all loose litter and other material and disinfected with a solution made with 6 ounces of 95 per cent pure liquefied carbolic acid to each gallon of water or a solution containing 4 ounces of cresol compound U. S. P. to each gallon of water. A permitted "Saponified cresol solution" at a dilution of at least 4 fluid ounces to 1 gallon of water. Chlorid of lime (30 per cent available chlorin) at a dilution of 1 gallon to 3 gallons of water.

Paragraph 2. Cars, boats, and other vehicles for use of the transportation into this state of healthy and non-exposed cattle, or other live stock, shall first be cleaned and disinfected as provided in paragraph 1 in this section, unless it shall be shown to the satisfaction of the..... .....either that said cars or other vehicles have been cleaned and disinfected under these regulations and have not carried or contained diseased or exposed animals since that cleaning and disinfection or that the cars have never been used for the transportation of diseased or exposed animals.

Section 5. Disinfection of stock yards and feeding stations.

Public stock yards and feeding stations, and approaches, chutes, alleys, and pens thereof which have contained diseased or exposed animals shall, before healthy or non-exposed animals for intrastate transportation are placed therein, be cleaned and disinfected as provided in Section 4 in this regulation. Failure to clean and disinfect said premises will subject them to quarantine.

Regulation 2
To Prevent the Spread of Splenetic, Southern, or Texas Fever in Cattle

Cattle originating in any area quarantined by the Secretary of Agriculture on account of the existence of splenetic, southern, or Texas fever, outside of the state of ....., shall not at any time be transported, driven, or allowed to drift therefrom into any portion of this state for any purpose, except in accordance with the rules and regulations of the United States Department of Agriculture for the prevention of the spread of splenetic, southern, or Texas fever.

Regulation 3
To Prevent the Spread of Scabies in Cattle

Cattle outside of this state shall not at any time be transported, driven, or allowed to drift from another state or the District of Columbia into any portion of this

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state for any purpose, except in accordance with the rules and regulations of the United States Department of Agriculture for the prevention of the spread of scabies in cattle.

Regulation 4
To Prevent the Spread of Tuberculosis in Cattle and Swine

Section 1. No cattle or swine affected with tuberculosis as disclosed by a physical examination, or by the tuberculin test, or by any other means, shall be shipped, trailed, transported, or otherwise moved from any state or the District of Columbia into this State.

Section 2. It is hereby ordered that any firm or corporation or any common carrier wishing to import into this state bulls, work oxen, or female cattle over six months old intended for breeding or dairy purposes, other than branded range stock, must procure before shipment a health certificate and a tuberculin test chart in triplicate from the State Veterinarian or Assistant State Veterinarian, or a veterinarian whose competency and reliability are certified to by the authorities charged with the control of diseases of domestic animals in the state from which the cattle are to be transported or moved, or from a Veterinary Inspector of the Bureau of Animal Industry of the United States Department of Agriculture. The original of this health certificate and tuberculin test chart must be attached to the waybill. The duplicate health certificate and tuberculin test chart must be sent to the State Veterinarian or proper official at destination in ample time to reach him before the arrival of the cattle. The triplicate health certificate and tuberculin test chart must be sent to the proper state official at place of origin. The health certificate and tuberculin test chart must show that the cattle are free from Texas fever ticks and symptoms of tuberculosis and all contagious, infectious, and communicable diseases. The tuberculine test chart must show that at least three temperatures were taken before injection of tuberculin two or three hours apart and five temperatures were taken after injection two hours apart, beginning ten hours after the tuberculin was injected.

Regulation 5
To Prevent the Spread of Hog Cholera and Swine Plague

Section 1. Swine outside of this state shall not at any time be transported, driven, or allowed to drift from another state or the District of Columbia into any portion of this state for any purpose, except in accordance with the rules and regulations of the United States Department of Agriculture for the prevention of the spread of hog cholera and swine plague.

Section 2. It is hereby ordered that any person, firm, or corporation or any common carrier wishing to import swine into this state of ..... for purposes other than immediate slaughter, must procure before shipment or movement in any manner a health certificate in triplicate from the State Veterinarian or Assistant State Veterinarian or a veterinarian whose competency and reliability are certified to by the authorities charged with the control of diseases of domestic animals in the state from which the swine are to be transported and moved, or from a Veterinary Inspector of the Bureau of Animal Industry of the United States Department of Agriculture. The original, duplicate, and triplicate copies of the health certificates shall be handled as certificates and tuberculin test chart as provided for in Section 2, Regulation 4. The health certificate must show that the swine are free from symptoms of all contagious and infectious diseases and have been immunized against hog cholera by the serum prepared under license from the Secretary of Agriculture not more than sixty days previous to shipment. After receiving this treatment they shall be disinfected in a 2 per cent solution of Compound Solution of Cresol U. S. P.

Regulation 6
To Prevent the Spread of Dourine in Horses and Asses

Horses and asses outside of this state shall not at any time be transported, driven, or allowed to drift from an infected section of another state or the District of Columbia into any portion of this state, except in accordance with the rules and regulations of the United States Department of Agriculture for the prevention of dourine in horses and asses.

Regulation 7
To Prevent the Spread of Glanders in Horses, Mules and Asses

Section 1. No horses, mules, or asses affected with glanders as disclosed by a physical examination or by the Mallein test or by any other means, shall be shipped, trailed, transported, or otherwise moved from any state or the District of Columbia into this state.

Section 2. It is hereby ordered that any person, firm of corporation, or any common carrier wishing to import horses, mules, or asses into the state of..... ..... must procure before shipment or the movement in any other manner a health certificate and a Mallein test chart in triplicate from the State Veterinarian or Assistant State Veterinarian, or a veterinarian whose competency and reliability are certified to by the authorities charged with the control of diseases of domestic animals in the state from which the horses,

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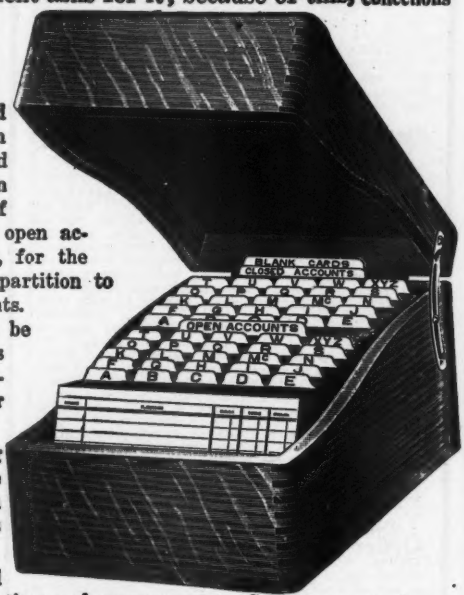

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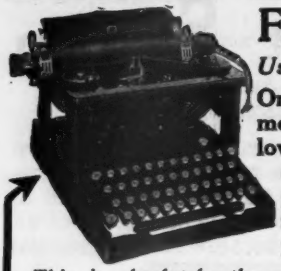

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mules, or asses are to be transported or moved or from a Veterinary Inspector of the Bureau of Animal Industry of the United States Department of Agriculture. The original, duplicate, and triplicate copies of the health certificates and Mallein test charts shall be handled as certificates and tuberculin test charts as provided for in Section 2, Regulation 4. The health certificates and Mallein test charts must show that horses, mules, and asses are free from any symptoms of all contagious, infectious and communicable diseases, and the test chart must show that at least three temperatures two or three hours apart were taken before injection and five temperatures were taken after injection two hours apart, beginning ten hours after the Mallein was injected.

Section 3. The ophthalmic mallein test for glanders has proved to be reliable and practicable. In lieu of a mallein test chart in triplicate, an ophthalmic mallein test certificate in triplicate will be accepted when certified to and handled in the same manner as provided for mallein test certificates in Section 2, Regulation 7.

Section 4. The ophthalmic mallein test certificate shall indicate that the result of the test with concentrated mallein showed negative reaction, record as follows: N = Negative. Eye unchanged.

Regulation 8
To Prevent the Spread of Scabies in Sheep

Section 1. Sheep outside of this state shall not at any time be transported, driven, or allowed to drift from another state or the District of Columbia into any portion of this state for any purpose, except in accordance with the rules and regulations of the United States Department of Agriculture for the prevention of the spread of scabies in sheep.

Section 2. It is hereby ordered that any person, firm or corporation, or any common carrier wishing to import sheep or goats into this state for purposes other than immediate slaughter, must procure before shipment or movement in any other manner a health certificate from the State Veterinarian or Assistant State Veterinarian of the state from which they are imported, certifying that the sheep or goats have been dipped within 10 days from the time of entry into the state in either a nicotine or lime-and-sulphur dip which has been approved by the United States Bureau of Animal Industry, or if they have passed through a public stock yards, a permit shall be obtained to bring them into the state subject to dipping on the premises of the owner at destination.

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ASSOCIATION MEETINGS

The information given below is up-to-date and has been furnished by the secretaries of the various associations listed. Secretaries are requested to supply us data regarding their associations after each meeting; otherwise, the association will necessarily be dropped from the list. We ask secretaries to kindly co-operate with us in keeping before the members of their associations the date and place of the next meeting.

Name of Association	Date of Meeting	Place of Meeting	Secretary
Alabama Vet. Med. Assn.			C. A. Cary, Auburn, Ala.
Alumni Assn., Col. of Vet. Med., O. S. U.		Columbus, O.	W. R. Hobbs, O. S. U., Columbus, O.
Alumni Assn., N. Y. State Vet. College	June 10, 1916	New York	P. K. Nichols, Port Richmond, N. Y.
Alumni Assn., U. S. Col. Vet. Surg.	April 14, 1917	Washington, D. C.	Chas. M. Mansfield, 1344 Newton St., Washington, D. C.
American Vet. Med. Assn.	Aug. 20-23, 1917	Kansas City, Mo.	L. A. Merillat, 1827 S. Wabash Ave., Chicago, Ill.
Arkansas Vet. Med. Assn.		Clarksdale, Miss.	R. M. Gow, Little Rock.
British Columbia Vet. Assn.	Sept. 20, 1917	Vancouver, B. C.	Kenneth Chester, New Westminster, B. C.
B. A. I. Vet. Assn. of So. Omaha	3rd Monday of month	So. Omaha, Neb.	J. W. Giffee, c/o B. A. I., So. Omaha
California State Vet. Med. Assn.	2nd Wed. in Mch., June, Sept., Dec.	Petaluma, Cal.	F. M. Hayes, Davis, Cal.
Central Canada Vet. Assn.		Ottawa, Ont.	H. D. Sparks, 448 Wellington St., Ottawa.
Central N. Y. Vet. Med. Assn.	Last week in June and Nov.	Syracuse, N. Y.	E. H. Yunken, 2344 N. 18th, Philadelphia W. B. Switzer, Oswego, N. Y.
Chicago Vet. Society	2nd Tues. of month	Chicago, Ill.	Glenn Brown, 3806 Lowell Ave., Chicago.
Colorado Vet. Med. Assn.		Denver, Colo.	I. E. Newsom, Ft. Collins, Colo.
Connecticut Vet. Med. Assn.	February 6	Hartford, Conn.	A. T. Gilyard, Waterbury, Conn.
Eastern Iowa Vet. Med. Assn.	Dec. 13	Muscatine, Ia.	Jno. Tillie, Muscatine, Ia.
Genesee County Vet. Med. Assn.		Rochester, N. Y.	W. J. Houden, Flint, Mich.
Georgia State Vet. Assn.	Sept. 18, 19, 1917	Columbus, Ga.	Peter F. Bahnsen, Capitol Bldg., Atlanta.
Hudson Co. Vet. Practitioners' Club	Monthly	Jersey City, N. J.	B. D. Blair, 782 Montgomery St., Jersey City, N. J.
Idaho Assn. of Vet. Graduates	Feb. 4, 1917	Boise, Idaho	C. V. Williams, Blackfoot, Idaho.
Illinois State Vet. Med. Assn.			L. A. Merillat, 1827 Wabash Ave., Chicago
Illmo Vet. Med. Assn.	April, 1917	Collinsville, Ill.	L. R. McKinley, Freeburg, Ill.
Indiana Vet. Med. Assn.		Indianapolis, Ind.	A. F. Nelson, Indianapolis, Ind.
Iowa Vet. Med. Assn.		Ames and Des Moines	H. B. Treman, Rockwell City, Ia.
Kansas Vet. Med. Assn.		Wichita, Kan.	J. H. Burt, Manhattan, Kan.
Kentucky Vet. Med. Assn.		Hopkinsville, Ky.	D. E. Westmorland, Owensboro, Ky.
Keystone Vet. Med. Assn.	2nd Tuesday of month	Philadelphia	L. B. Davis, 857 E. Girard, Philadelphia
Lake Erie Vet. Med. Assn.	1st Tuesday in Dec.	Norwalk, O.	N. D. Backus, Elyria, O.
Los Angeles Vet. Med. Assn.	3rd Wed. of month	Los Angeles	J. A. Dell, 16th & Pacific, Los Angeles
Maine Vet. Med. Assn.		Augusta, Me.	M. E. Maddocks, Augusta, Me.
Manitoba Vet. Assn.	Feb. 15	Winnipeg, Man.	W. Hilton, 275 James St., Winnipeg.
Massachusetts Vet. Assn.	4th Wed. each month	Worcester in Sept.; Boston rest of year	E. A. Cahill, Boston, Mass.
Michigan State Vet. Med. Assn.	1st Tues. & Wed. after 1st Mon. in February	Lansing, Mich.	W. Austin Ewalt, Mt. Clemens, Mich.
Minnesota State V. M. Assn.	2nd Tues. & Wed. Jan.	St. Paul	G. Ed. Leech, Winona, Minn.
Mississippi State Vet. Med. Assn.		Clarksdale, Miss.	E. S. Norton, Greenville, Miss.
Mississippi Valley Vet. Med. Assn.	July 7, 1916	Galesburg, Ill.	W. Lester Hollister, Avon, Ill.
Missouri Valley Vet. Assn.	Feb. 14, 15, 16, 1917	St. Joseph, Mo.	R. F. Bourne, 1236 E. 15th, Kansas City.
Missouri Vet. Med. Assn.	Last week in July	Neosho, Mo.	C. D. Folse, 1236 E. 15th St., Kansas City
Montana Vet. Med. Assn.		Missoula, Mont.	A. D. Knowles, 302 S. 4th St., West Missoula, Mont.
Nat'l Assn. B. A. I. Employees	2nd Mon. in Aug., 1917	Omaha, Neb.	S. J. Walkley, 185 N. W. Ave., Milwaukee.
Nebraska Vet. Med. Assn.	2nd Tues. & Wed. in Dec.	Lincoln, Neb.	S. W. Alford, Lincoln, Neb.

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Name of Association	Date of Meeting	Place of Meeting	Secretary
New York State Vet. Med. Society	Aug. 2, 3, 4	Brooklyn, N. Y.	C. P Fitch, Ithaca, N. Y.
North Carolina Vet. Med. Assn	June 26, 27, 1917	Charlotte, N. C.	J. P. Spoon, Burlington, N. C.
North Dakota Vet. Assn	July, 1917	Fargo, N. D.	W. J. Mulroony, Havana, N. D.
Northeastern Indiana Vet. Assn	Nov. 14	Ft. Wayne, Ind.	C. R. Baumgartner, Arcola, Ind.
Northwestern Ohio Vet. Med. Assn	Feb. 16	Toledo, O.	Paul E. Wood, Ottawa, Ohio.
Ohio State Vet. Med. Assn		O. S. U. Columbus, O.	F. A. Lambert, care O. S. U., Columbus.
Ohio Valley Vet. Med. Assn	1st week in Feb., 1917	Terre Haute, Ind.	G. J. Behrens, Evansville, Ind.
Oklahoma State Vet. Med. Assn	Oct. 23, 24, 25	Oklahoma City	R. C. Smith, Enid, Okla.
Oregon Vet. Med. Society	June, 1917	Probably Salem, Ore.	B. T. Simms, Corvallis, Ore.
Pennsylvania State Vet. Med. Assn		Harrisburg, Pa.	E. H. Yunker, 2344 N. 18th, Philadelphia.
Rhode Island Vet. Med. Assn	2nd Tues. Jan.		U. S. Richards, Woonsocket, R. I.
Schuylkill Valley Vet. Med. Assn	Dec. 21, 1916	Reading, Pa.	C. R. Potteiger, Reading, Pa.
South Dakota Vet. Med. Assn	July 11, 1916	Lake Madison	S. W. Allers, Watertown, S. D.
Southeastern States Vet. Med. Assn	Dec. 27, 28	Atlanta, Ga.	G. A. Roberts, West Raleigh, N. C.
Southern Aux. Cal. State Vet. Med. Assn.	Dec. 20, 1916	Los Angeles	J. A. Dell, 16th & Pacific, Los Angeles.
Tenn. Vet. Med. Assn	Nov., 1917	Columbia, Tenn.	F. R. Youree, Lebanon, Tenn.
Texas Vet. Med. Assn		Not decided	E. M. Wiggs, Greenville, Texas.
Twin City Vet Med. Society	Once a month	St. Paul	C. C. Palmer, St. Paul, Minn.
U. S. Live Stock Sanitary Assn		Chicago	J. J. Ferguson, U. S. Yards, Chicago.
Utah Vet. Med. Assn	Feb. 5	Logan, Utah	E. P. Coburn, Brighton City, Utah.
Veterinary Assn. of Saskatchewan	March 15, 1917	Regina, Sask.	R. G. Chasmar, Hanley, Sask.
Vet. Med. Assn. of New Jersey	2nd Thurs. in Jan.	Trenton, N. J.	E. L. Loblein, New Brunswick, N. J.
Vet. Med. Assn. of N. Y. City	1st Wed. ea. mo. except July, Aug., Sept.	New York City	R. S. MacKellar, 351 W. 11th St., N. Y.
Vet. Med. Assn. of Geo. Washington Univ.	1st Sat. each month	Washington, D. C.	C. W. Rippon, 2115 14th St., N. W., Washington, D. C.
Vet. Med. Society Wash. State College	1st and 2nd Tues. ea. mo.	Pullman, Wash.	Claude Holden.
Virginia State Vet. Med Assn		Richmond, Va.	W. G. Chrisman, Blacksburg, Va.
Washington State Vet. Med. Assn	June, 1917	Pullman, Wash.	Carl Cosler, Bellingham, Wash.
Western N. Y. Vet. Med. Assn	4th week, June, 1917	Buffalo, N. Y.	F. F. Fehr, 36 Prospect Ave., Buffalo.
Wisconsin Vet. Med. Assn		Madison, Wis.	W. A. Wolcott, Madison, Wis.
York Co. Vet. Med. Society	1st Tues. after 1st. Mon. of each month	York, Pa.	E. S. Baustieker, 325 Newberry, York, Pa

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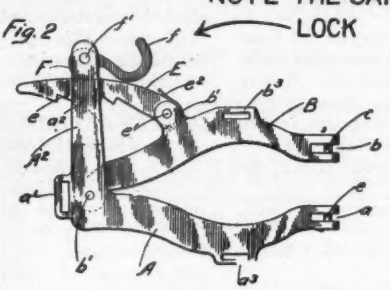
NOTE THE SAFETY LOCK

Fig. 2



Dunn's "Safety" Mouth Speculum

PAT. SEPT. 28TH 1915

It is anatomically correct and provided with safety locks that prevent closing accidentally under any circumstances. The simplicity of the device is shown in the illustration. Besides the addition of the *safety locks* it has improvements that make it the *Safest, Most Practical and Durable* Speculum of this pattern on the market.

Price with Cupped Plates, only.....$10.00
Gum Plates, extra per pair..... 1.50

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Mfg. Dealers and Exporters of

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OHIO BRANCH: D. BOURNE, 6 Miami Valley Bank Building, HAMILTON, OHIO.
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school to accommodate more than five men at a time.

KANSAS VETERINARIANS MEET AT WICHITA

The thirteenth annual meeting of the Kansas Veterinary Medical Association was held at Wichita, January 3d and 4th. Nearly a hundred members attended. The sessions were held at the Eaton Hotel and in the Council Chamber of the City Hall.

The following program was given on Wednesday:

Address of Welcome—Mayor of Wichita.

Response—Dr. B. R. Rodgers.

President's Annual Address—Dr. W. J. Guilfoil.

Urethral Calculi—Dr. L. D. Eastman.

Some Useful Instruments and Appliances—Dr. C. E. Bassler.

Chronic Diseases of the Mammary Glands of Cows—Dr. R. C. Moore.

Vescicular Stomatitis—Dr. A. T. Kinsley.

Proprietary Remedies and Their Advertising Media—Dr. B. W. Traux.

The Practitioner's Round Table—Dr. C. E. Salsbery.

Officials of the Wichita-Oklahoma and Southwestern Serum Companies entertained the visitors at luncheon Thursday and at a theater party Thursday night. Routine business was disposed of at the sessions held Thursday.

Dr. R. R. Dykstra of Manhattan was elected president, Dr. J. H. Burt was re-elected secretary and treasurer, Dr. I. G. Wimsett of Winfield was appointed a member of the executive committee. Manhattan was chosen for the meeting place next year.

SOUTHEASTERN STATES ORGANIZE VETERINARY MEDICAL ASSOCIATION

Atlanta, Ga., December 27th and 28th.—In the absence of the temporary chairman, Dr. C. A. Cary was nominated and elected to fill the chair. Dr. G. A. Roberts was first called upon to state briefly the purposes of the new organization, which were:

Promotion of acquaintance and good fellowship among the members of our profession in the southeastern states.

The popularizing of our profession in the eyes of the public and our clients.

Enhancing our own "preparedness" through exchange of ideas.

Affording every veterinarian within the described territory an opportunity to serve his profession in a larger measure than through his state association alone.

Dr. N. S. Mayo then presented his paper on "Some New Therapeutic Suggestions." He mentioned specifically many uses of the

Incubation Room

BEEBE Anti-Influenza Vaccine

Used for years on thousands of animals by the largest veterinary practitioners with practically 100 per cent success.

***Single Vaccine No. 5**

Prices

Single doses	$0.50
Four doses	1.50
Twelve doses	4.00
Bulk package (60 c. c.)	5.00

Double Vaccine No. 6

Prices

One dose	$0.75
Two doses	1.25
Six doses	3.25

(Special quotations given in larger quantities.)

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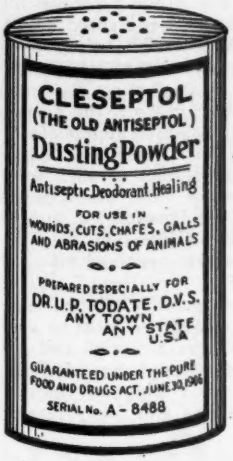
Mark Twain once remarked:

"It's Only a Difference of Opinion that Makes a Horse Race."



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Sells, per can.....50c
Profit, per can....37½c

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Containing calomel, boric acid, camphor, alum, copper sulphate, and carbolic acid, mixed with pure talcum—all powerful healing agents—"Cleseptol" "takes the lead" as

THE SATISFACTORY DUSTING POWDER

Antiseptic - Deodorant - Healing

Invaluable for wounds, cuts, abrasions, galls.

Put up in 6-oz. sifting top cans, always ready for use.

One gross, your label	$16.75
One-half gross, your label	8.75
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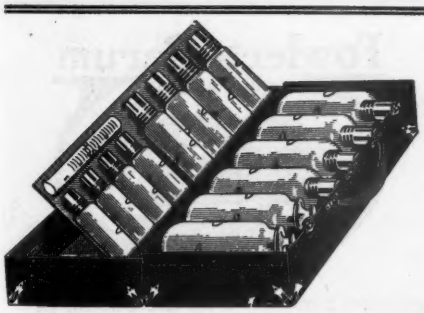

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The I. V. A. is a medicine case, pure and simple, with just enough bottles of the right capacity to answer the needs of the Busy Veterinarian. The large number of sales proves that this Case is built on the right plan—because it meets the demand. Veterinarians write: "Send me an I. V. A. —it's just what I have been looking for, for a long time." Are you next?

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The W. G. Cleveland Company

"The Western House for the Western Doctor"

Omaha, Nebraska

newer preparations—as emetin, lobelin and chlorazene.

Dr. Cary next presented his paper on "Operations for Abdominal Hernias." He illustrated his paper by drawings on the blackboard. He advocated correct diagnosis and operating under complete anesethesia. His method was to dissect around the sac, removing same, but leaving at least one-half inch of its base around the ring for a granulating surface. Stitches of heavy silk were put in and the ring closed by same. Drainage was supplied and a many-tailed bandage put on.

After dinner, the chair called for the paper of Dr. B. F. Kaupp, on "Healing of Fractures in Fowls." He discussed the subject from three viewpoints, namely: the histology and regeneration of bones, repairative processes and treatment and after-care of the bird.

At this juncture, Mayor Woodard of Atlanta, put in his appearance, and was called upon for an address of welcome. He assured us that we were welcome and that he was delighted to make his farewell greeting to Atlanta as mayor, to so worthy a calling as the veterinary profession.

Dr. Mayo happily responded to the address of welcome urging better training for the veterinarians and holding up the ideal through a thorough examination, but not an unreasonable one, by the State Examining Board.

Dr. J. W. Salter followed with his paper on "Open Joints in Equines." He took the position that thorough cleansing of the surrounding parts was good treatment but that no material of any kind should be injected into the joint nor any probing permissible.

Dr. G. A. Roberts next presented his paper on "Contagious Abortion Infections in Animals." He contended that while there was a possibility of attributing too much from such infections, by some, the average veterinarian did not begin to appreciate the full significance of such infection. Again, while the attributed results of such infections might also occur from other causes, the most satisfying explanation for such results was on theory of infection.

Dr. M. R. Blackstock then read his paper on "Cottonseed Meal as a Food." He reminded us that in quantity of one quart twice daily mixed with other feeds to average sized cows it was a useful and safe feed. However, he believed excessive feeding of cottonseed meal might be responsible for some abortions and many retained placentae.

"Hemorrhagic Septicemia," by Dr. F. P. Caughman, proved a very entertaining paper dealing with prevalence of the disease, types, and citations of several outbreaks.

U.S. Veterinary License No. 103

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The benefits of everything are best judged by the results.

We comply with every existing regulation prescribed by the Bureau of Animal Industry.

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are made by veterinarians who strive earnestly to maintain the eminence and good will we have earned.
Prompt attention given all orders.

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Fowler Serum Can Be Had Direct, or Through Any Armour and Company Branch House.

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A New Hypodermic Tablet

Arecoline Hydrobromide	gr. 1/2
Lobeline Sulphate	gr. 1/10
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A quick-acting purgative for equines. Lobeline Sulphate is antispasmodic and relaxant. It stimulates intestinal secretions and peristalsis.

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Reduced Prices

	Special Hypodermic	Oral
1 ounce	$0.35	$ 0.32
4 ounces	.80	.65
16 ounces	2.60	2.00
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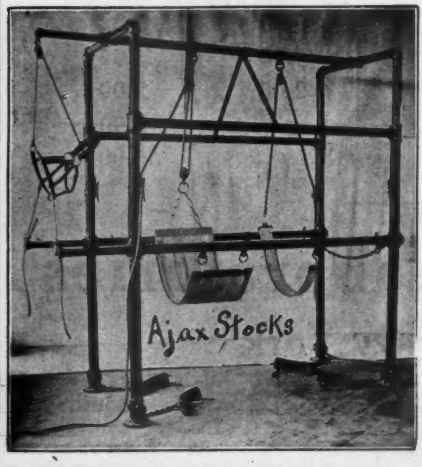


The last paper of the first day's meeting was by Dr. D. A. Piatt on "The Veterinarian and Some of His Problems." Among the more or less difficult problems of the veterinarian he stated, was that of collections. He gave us several unique suggestions as to the character of follow-up statements.

At this point, the association went into a business session. They adopted constitution and by-laws and the following resolutions were accepted:

1st. Resolution of condolence to the temporary secretary, G. A. Roberts, in the recent loss of his beloved wife.

2nd. Resolved, That the Southeastern States Veterinary Medical Association in regular annual meeting assembled, urge the A. V. M. A. to hold their 1918 meeting in the City of Atlanta, Ga. Nothing that the A. V. M. A. could do would have a more uplifting influence on the profession in the South than to grant this urgent request.

3rd. Resolved, That the Resolution Committee recommend that the next annual meeting be held at Chattanooga, December 27, 28 and 29, 1917.

The following officers were elected for the ensuing year:

President—Dr. C. A. Cary, Auburn, Ala.

First Vice-President—Dr. F. W. Morgan, Chattanooga, Tenn.

Second Vice-President—Dr. J. W. Scheibler, Memphis, Tenn.

Third Vice-President—Dr. Benj. McInnes, Charleston, S. C.

Secretary-Treasurer—Dr. G. A. Roberts, Raleigh, N. C.

To serve with the above, as Executive Committee:

Dr. M. R. Blackstock, Spartanburg, S. C.

Dr. W. W. Webb, West Point, Ga.

Resident State Secretaries:

Alabama—Dr. D. A. Piatt, Birmingham.

Florida—Dr. Major Scofield, Miami.

Georgia—Dr. P. F. Bahnsen, Atlanta.

Mississippi—Dr. E. M. Ranck, Agricultural College.

North Carolina—Dr. A. C. Jones, High Point.

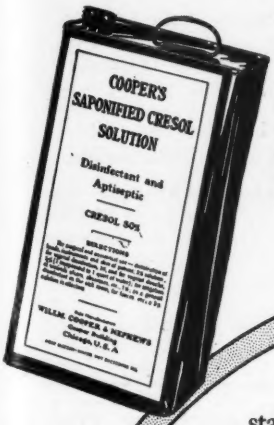
South Carolina—Dr. F. P. Caughman, Columbia.

Tennessee—Dr. Wm. M. Bell, Nashville.

It was voted to leave the list for charter membership open for ninety days.

Drs. D. M. Campbell and M. S. Mayo of Chicago were elected to honorary membership.

The first paper presented on the second day was "Interstate Health Certificates," by P. F. Bahnsen. He urged fair but reasonable charges to be made for examinations, and that all veterinarians making such examinations should consider themselves



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Veterinarians, the world over, know the standard of quality that stands behind the COOPER name. With this in mind it will be sufficient to say we know that **Cooper's Saponified Cresol is a most effective antiseptic and germicide.**

The leaders of your profession have given us their corroboration. They inform us that they have made **Cooper's Saponified Cresol** a standard item of their Materia Medica. You will find it especially efficacious in checking intestinal fermentation, in relieving bloating in cattle and sheep and in destroying stomach and intestinal worms.

As an antiseptic **Cooper's Saponified Cresol** is exceptionally powerful, containing 50 per cent pure Cresol. Repeated tests have proven it to be more effective than phenol or creolin. It may be dissolved in water, alcohol, chloroform or glycerine. It does not irritate, it is only one-eighth as toxic as creolin, and neither corrodes nor discolors surgical instruments.

We will be pleased to send you a **Free Sample of Cooper's Saponified Cresol,** and our booklet describing many of its therapeutic uses.

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agents of the state into which shipment is to be made and be willing, therefore, to comply with such state's requirements. He stated that Georgia would accept a hog breeder's certificate sworn to before a notary public that serum injection had been made not more than fourteen days previous to shipment and not less than three weeks after the simultaneous injection.

Among the more interesting papers of the whole program was that of "Some Legal Phases of Veterinary Practice," by Dr. D. M. Campbell. The good points mentioned in his paper are too numerous to mention here, but we hope all will have opportunity to read his entire paper when published.

The last paper on the program was "The Veterinary Profession and Its Future," by Dr. S. O'Toole. He insisted on good preparation at college, efficient control by state boards and a high ambition of all members of the profession.

The meeting was attended by something like sixty veterinarians from Georgia, Tennessee, Alabama, North and South Carolina and Florida. All present expressed themselves as greatly pleased and agreeably surprised at both the number present and the character of the program.

Raleigh, N. C. G. A. ROBERTS, Sec.

THE NEWSPAPERS SAY

Recently it was widely published in the daily press that Colorado stockmen had started a war on coyotes because of alarm over the spread of rabies in adjoining states, the situation in Montana, Wyoming, Utah and the Pacific states being very bad. Dr. W. J. Butler, State Veterinarian of Montana, calls attention to the error in this statement in so far as it applies to Montana, in which state he says there has never occurred a case of rabies, either in dogs or cattle.

Dr. H. W. Knoernschild has changed his location from Prairie du Chien, Wis., to Earlville, Iowa.

A New Drenching Halter

(Patent applied for)

Guaranteed to hold a horse or cow in a position that makes drenching easy. Write for circular describing our all-rope casting harness and all-rope sling for the easy raising of decubital animals

R. M. Beachy, Veterinarian, Meyersdale, Pa.

Mr. Veterinarian:

Note the Modern and Sanitary Way of Defibrinating Anti-Hog Cholera Serum.

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Dr. Charles Keane was reappointed State Veterinarian of California, December 14th, by Governor Johnson for a term of four years. The office carries with it an annual salary of $3,600, which may be raised during the coming legislature because of the added duties of the office in connection with the enforcement of the pure milk law.

Dr. L. R. Booton has moved from Tekon,

A Six Week POST GRADUATE COURSE

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beginning Monday, January 22, 1917, ending March 3, 1917.

Resolve today to take that "brush-up" course you have long planned to invest in. A progressive school now located in an entirely new modern college building and hospital planned by **Dr. Robert C. Moore**, President, and built for the special purpose.

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Students at the national capital enjoy unequaled advantages for acquiring a broad education. The clinics, hospitals, military posts, government laboratories, experiment stations and libraries afford facilities for education not obtainable elsewhere.

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GEORGE B. McKILLIP, Sec., Dept. E, Wabash Ave. - - - - - - - Chicago

Wash., to Williamsfield, Ill., where he will take over the practice of Dr. Ira M. Davis, deceased.

Veterinarians of Decatur, Johnson, Rush, Bartholomew and Shelby counties, Indiana, formed an organization known as the South Central Indiana Veterinarians' Association at Shelbyville., Ind., December 15th. They met again at Franklin, Ind., January 18th. Dr. A. W. Stubbs of Shelbyville was elected president and Dr. C. B. Ainsworth of Greensburg, secretary and treasurer.

I am very much pleased with "Lameness of the Horse," by Lacroix.

Columbus, O. O. T. HOLLOWAY.

I received the copy of "Lameness of the Horse" today and believe it is a splendid work and will fill a long felt want.

Bellefonte, Pa. DR. S. M. NISSLEY.

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A Laboratory of Surgical Technique. An ethical scientific institution for veterinarians who desire to improve their methods and bring their knowledge up to modern standards. Personal instructions and elective courses are the prominent features. Open to graduates of accredited veterinary colleges from October 1st to July 1st. For catalog and other information address,
E. Merillat, Secretary,
1827 S. Wabash Ave.,
Chicago, Ill.

Four calves, weighing in all 140 pounds, were born to a cow recently on a farm near Barron, Wis. Two were born in the morning, the other two in the afternoon.

The Grand Island (Neb.) Horse and Mule Company on December 19th closed a new contract with the British government for an indefinite number of horses. It is expected that between 10,000 and 15,000 horses will be delivered under this contract.

According to the Governor of Missouri, the state legislature appropriated $20,000 as recompense to the owners of cattle slaughtered to prevent the spread of disease. All of this money has been used and there are outstanding accounts now against the fund for $125,000. The Governor also stated that every claim represents an animal worth $200, and that scrub cattle do not seem to have been affected by disease.

I am well pleased with Lacroix's "Lameness of the Horse." I think it is an ideal book for every veterinary student to have, as it will assist him wonderfully in diagnosing lameness during his clinical hours.

T. W. UDY, *Senior Student.*
U. S. College of Veterinary Surgeons.
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DR. L. B. GRAHAM, President and Gen. Manager
W. J. MENARY, Treasurer
DR. J. W. GRIFFITH, Secretary

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PERFECT POTENCY permits advocating and advertising.
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HIGHEST STERILITY is assured by "bacterial count" made by disinterested experts. These features make
IMPERIAL SERUM **"Just a little safer"**.....**Price 1½ cents**
VIRUS GRATIS
A SUPER-SERUM of unusual merit, produced up to a consistent high standard, not down to a price to keep within selling costs. You will like it.

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Discard "equine cough syrups," "fever mixtures," and similar relics of the dark ages. **Get results! Get your money's worth! Get busy! Get GUAIALYPTOL. Price: Pint, $1.25; 5-Pts., $4.50; Gallon, $6.00.**

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A new, perfectly balanced ration which contains all food elements in proper proportion to promote the health, strength and growth of any breed or size of dog. 28% protein.

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MOST CONVENIENT TO FEED

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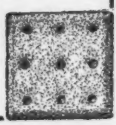

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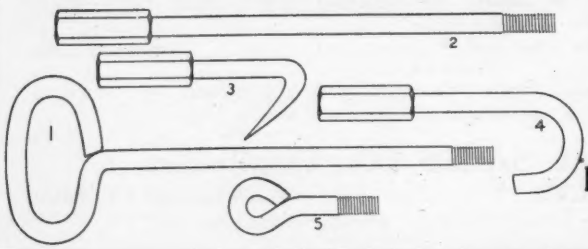

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Extra 45° Angle Cutting Blade . $1.00

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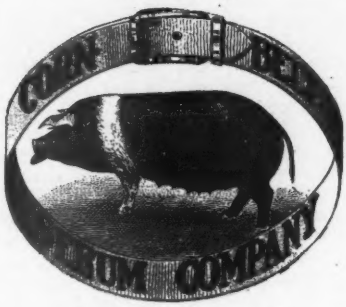

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Dr. F. Duncan of Ithaca, Mich., has retired from practice on account of poor health, and Dr. F. R. McNabb of Alma has bought the business, hospital and residence.

Veterinarians of Fayette, Union and Wayne counties, Indiana, met at Richmond, Ind., December 7th, and organized the Tri-County Veterinary Association with 12 members. Dr. Lee C. Hoover was elected president and Dr. George B. Ferling, secretary-treasurer. The association will hold meetings every two weeks. Dr. York of Winchester promoted the organization.

The issue of the Youth's Companion for January 4th contains an interesting popular discussion of the diseases of wild animals in the Bronx Park Zoological Garden of New York City. It is stated that three veterinarians constitute the medical staff and have full charge of the feeding, housing and treatment of the wild animals. It is pointed out that the commonest ailments of the wild animals are intestinal parasites and indigestion with pneumonia closely following these in importance. Some description is given of the means resorted to in medicating the animals.

"If necessary to save the life of one baby I would kill every head of cattle in the United States which showed a trace of tubercular infection," Representative Linthicum of Maryland is reported to have stated on the floor of the House, January 5th, in urging an amendment to the agricultural bill providing for an investigation of tuberculosis in cattle. The amendment was adopted.

Dr. W. A. Scott of Columbus, Ohio, has been reappointed a member of the state board of veterinary examiners for a term of five years.

The first report of the Wyoming state board of veterinary examiners shows that they have granted licenses to practice to 31 graduate veterinarians and six non-graduates. The fees for testing and examination of livestock were set as follows:

Tuberculin, at home: $5.00 for one head, $2.00 per head for the next five, and 50 cents per head for each additional animal over six.

Tuberculin, away from home: $10.00 and expenses for ten head, 50 cents per head and expenses for each additional animal.

Mallein Test, at home: $5.00 for one animal, $2.00 per head for next five, 50 cents per head for each additional animal over six.

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The officers of the board are Dr. Elmer Gould, Basin, president; Dr. S. W. Peck, Salt Creek, vice-president; and Dr. J. R. Bond, Cheyenne, secretary. The board met last year for the first time in Cheyenne.

The Universal Screen Magazine, No. 4, released January 5th, shows in motion pictures the modern method of dealing with accidents to horses. The special auto ambulance which draws the animal in by electric motor is ilustrated. Then the electric crane which lifts the horse into the operating room and the method of operating, are shown.

Twelve head of horses owned by farmers near Regent, N. D., were condemned by federal veterinarians and shot becaues of glanders, December 26th.

The Colombian government will establish bacteriological laboratories on the coast and in the interior cattle raising districts to study regional diseases of cattle and prepare remedies.

Dr. J. I. Gibson, State Veterinarian of Iowa, has recommended in his budget that the pay of assistant state veterinarians be increased from $5 to $8 a day. His recommendations also provide for an advance in the state veterinarian's salary from $1,800 to $3,000, and his assistant from $1,500 to $2,400. An appropriation of $100,000 is asked to be used in fighting tuberculosis in Iowa livestock and in control of hog cholera.

State Veterinarian Geo. W. Dunphy of Michigan organized the veterinarians of Berrien and Cass counties into an association to fight communicable stock diseases in that section, the first session being held at Niles, Mich., December 15th. The organization comprises 12 veterinarians, who will hold monthly meetings. The officers elected were Dr. L. A. Hosbein, Coloma, president; Dr. W. T. Graham, Niles, vice-president; Dr. Leon Winter, Eau Claire, secretary-treasurer.

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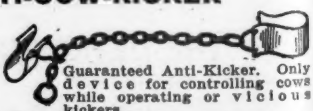

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Dr. V. Mann, who has been veterinarian in charge of W. T. Hale's horse and mule market at Oklahoma City for the past eight years, recently moved to Watonga, Okla., where he has taken over the practice of Dr. Hinckley. The latter has been appointed State Veterinarian.

Dr. D. F. Luckey, State Veterinarian of Missouri; Dr. A. T. Peters, of Peoria, Ill.; Dr. J. F. Gillespie of Tuscola, Ill.; Dr. John Beer of Blue Island, Ill., and Dr. F. F. Brown of Kansas City, were prominent contributors to the program of the twenty-second annual meeting of the Illinois Live Stock Breeders' Association, held at Champaign, Ill., January 8, 9, 10 and 11.

Dr. W. L. Williams of Cornell conducted a conference of cattle growers at Sacramento, Cal., December 26th, under the auspices of the University of California and the California State Veterinary Medical Association. The problems discussed were chiefly those relating to contagious abortion, sterility and allied troubles of cattle.

A bill will be introduced into the coming general assembly of Iowa providing for the tuberculin testing of pure bred dairy and breeding cattle. Two years ago a bill for testing of cattle with tuberculin passed the house but failed of passage in the senate. The promoters of the present bill have presented statistics showing that Iowa hogs and cattle are discriminated against by the packers because of the prevalence of tuberculosis among Iowa livestock. A federal report shows that for the year ending June 30, 1916, there were 285,605 head of cattle slaughtered at Iowa abattoirs, of which eight-tenths of one per cent were condemned on account of tuberculosis as unfit for food. In the same period there were killed at Iowa stations 2,843,794 hogs, of which 426,678 were retained on account of tuberculosis and of those retained 8,793 were condemned as unfit for food. As a consequence, buyers pay from 13 to 25 cents less per hundred pounds for Iowa hogs as compared to western hogs because they have to discard a certain percentage of them for having tuberculosis. Cattle also suffer a penalty because of this. It is pointed out that the economic loss reaches millions of dollars.

The formal organization of the Eastern Iowa Veterinary Medical Association was formed at Muscatine, December 15th. Dr. J. S. Potter of Iowa City was elected president and Dr. R. O. Buerrum of Muscatine, secretary-treasurer. A committee composed of Drs. S. E. Houk and R. O. Buerrum of

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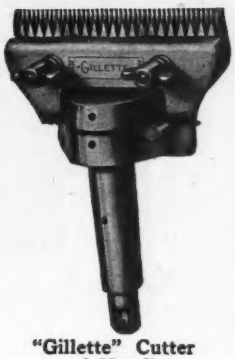

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Muscatine and Dr. Henry Hell of New Liberty, was appointed to draw up a constitution and by-laws for the organization. The convention closed with a discussion of the methods used to fight hog cholera in the state by the B. A. I. representative, Dr. J. S. Koen of Des Moines.

The Hawkeye Progressive Veterinary Medical Association (non-graduate) held its annual meeting at Des Moines, Iowa, December 28, 29 and 30. Dr. J. N. Cozzens of Colo, Iowa, is president and E. T. Lowry of Ottumwa is secretary.

Miss Ida Himmelreich, a humane officer of Waukegan, Ill., claims that horses have the skin torn from their tongues by touching the frosty iron railings where they are hitched. To prevent this she suggests that the railing be covered with burlap.

Dr. J. S. McDaniel resigned his position as a member of the faculty of the Veterinary Department of the Michigan Agricultural college the first of the year. He is now with the Extension Department of the University of Missouri with headquarters at Columbia.

Dr. J. P. Hutton resigned his chair as surgeon at the Michigan Agricultural College Veterinary Department last month and is now engaged in practice in Wooster, Ohio.

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